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# TRANSACTIONS

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*Continued on page 3 of Wrapper.*



III. *An Account of the South-American Cheliferinæ in the Collections of the British and Copenhagen Museums.* By C. J. WITHE.\*

Received January 2, 1907; read April 23, 1907.

[PLATES XXIX.—XXXI.; Text-figures 64–84.]

AT the suggestion of the Director of the British Museum, I have worked out the collections of *Chelonethi* belonging to that institution; this paper deals only with the South-American part; for showing me this confidence I ask Sir E. Ray Lankester to accept my best thanks. I am also obliged to Dr. C. F. Meinert, the Curator of the Arthropods of the Copenhagen Museum, for letting me work out its rich collections of South-American *Cheliferinæ* Sim., partly collected by Dr. Meinert himself in Venezuela. I most heartily thank, too, Mr. Edw. Ellingsen, of Kragerö (Norway), for placing several of his original specimens of South-American species at my disposal, as well as Mr. A. S. Hirst, who was kind enough to assist me with the literature in several ways.

Copenhagen, November 1906.

GENERAL REMARKS.

The author who has done more than any other to advance the study of the *Cheliferinæ* from South America is L. Balzan. His researches have converted this region from practically "terra nuda" to one of the best-explored continents with respect to the group in question. Later E. Ellingsen published a number of papers describing imperfectly known and new species. He has also done much to increase our knowledge of the geographical distribution of these animals, and by practical analytical keys has made the study and determination of the species a fairly easy task. As the collection at my disposal was very rich (at least 300 specimens, comprising 36 species, of which 13 were new—about 45 species having been previously described), and included a large percentage of the known species, as well as several new ones, and as I found that important groups of organs were scarcely mentioned in the somewhat imperfect descriptions given in Balzan's earlier papers, I thought it would be very useful to work out a kind of monograph. The richness of the material also made it possible for me to define more sharply than in a recently published paper the limits of the systematic groups, most of which in future will probably be recognised as natural genera†.

\* Communicated by Dr. W. T. CALMAN, F.Z.S.

† To two papers of Alb. Tullgren (23–24), in which he deals with South-American *Chelonethi*, I have not been able to pay due attention because they were published during the printing of this paper.



Some of the species established may possibly be identical with forms described by Banks from North America; but if this proves to be the case I may be excused by the fact that the descriptions of that author, at least so far as the False-Scorpions are concerned, are generally too imperfect for even approximate identification.

The South-American and perhaps all *Cheliferinæ* are divided into at least four groups; the reasons why I have not given these groups the rank of genera are, that one of them may be subdivided, that some interesting species were not at my disposal, and that a comparative investigation of the male organs ought to be undertaken before definitely settling the case.

*Key to the Groups of Cheliferinæ (Simon).*

- a. Fingers of the palps without accessory teeth. Galea better developed in females than in males.
  - a<sup>1</sup>. Femora of the first pair of legs with slightly developed articulation between the two portions, with the posterior condylus placed higher than the anterior; flagellum consisting of four hairs; ♂ with sternal spines; distinct transverse grooves; obtuse or clavate hairs; generally real eyes; "tactile" hair of tarsus IV. well removed from base; claws and subterminal hair simple . . . II. Group of *Chelifer subruber* Sim.
  - b<sup>1</sup>. Femora of the first pair of legs with well-developed articulation and with posterior condylus placed lower than anterior; ♂ never with sternal spines.
    - a<sup>2</sup>. Real eyes; obtuse or clavate hairs; "tactile" hair of tarsus IV. far removed from the base; distinct transverse grooves; genital area of ♂ with long ram's-horn-shaped organs; coxæ IV. (♂) with coxal sac, and its tergites often with lateral keels; claws and subterminal hair generally with teeth . . . I. Group of *Ch. cancroides* L.
    - b<sup>2</sup>. No real eyes; pointed almost simple hairs; "tactile" hair of tarsus IV. basal; transverse grooves generally indistinct or wanting; genital area of ♂ without ram's-horn-shaped organs; coxæ IV. without coxal sac and tergites without lateral keels; claws as well as subterminal hair always simple.
      - IV. Group of *Ch. birmanicus* Thor.
- b. Fingers of the palps with accessory teeth. Femora of the first pair of legs with well-developed articulation between the two portions and with posterior condylus placed lower than anterior.
  - III. Group of *Ch. cimicoides* F.
    - a<sup>3</sup>. "Tactile" hair of tarsus IV. more than  $\frac{1}{4}$  removed from base; tibia IV. without dorsal median "tactile" hair; tibia of the palps without posterior "tactile" hairs in middle; galea larger in ♀ than in ♂.
    - a<sup>4</sup>. Four hairs in flagellum; real eyes; abdominal tergites with 30 short clavate hairs along hindmost margin and 8 in front.
      - III a. Subgroup of *Ch. rudis* Balz.



*b'*. Three hairs in flagellum; generally ocular spots; abdominal tergites with not more than 6 hairs in front of the marginal row.

*a'*. Hand at least 1.1 as long as the tibia; transverse grooves generally wanting; obtuse or pointed hairs.

III *b*. Subgroup of *Ch. subrobustus* Balz.

*b'*. Hand less than 1.1 as long as the tibia; transverse grooves always present . . . . . III *c*. Subgroup of *Ch. bicolor* Balz.

*b'*. "Tactile" hair of tarsus IV.  $\frac{1}{2}$  removed from base; tibia IV. with dorsal median "tactile" hair; tibia of the palps with two posterior "tactile" hairs; no sexual difference in galea; hairs pointed and almost simple . . . . . III *d*. Subgroup of *Ch. argentinus* Thor.

In the following are set forth a few remarks about the specific characters. The structure of the *eyes* is, of course, of some importance, but undue value should not be given to this character, as variations are sometimes found within the same species, at least between males and females. The shape of the *cephalothorax*, or more correctly the cephalothoracic shield (for instance, its length compared with its breadth), the structure of the transverse grooves, of the granulations and hairs are, of course, of some importance. The development of the *galea* is of no small value within certain groups, but its sexual and often important individual variations must necessarily be taken into account; the *flagellum* is of more generic than of specific value. The shape of the *serrula* and *lamina interior* shows specific differences, but as the individual variations are often well pronounced, and as they are rather difficult to examine, I think that they are generally not worth describing.

In the description of the *palps* not only is the shape of the joints important, but also the proportions between their length and breadth. The relative proportions of the different joints are of the greatest importance. As far as the hand is concerned it is necessary sharply to distinguish between the breadth and the depth, to give their proportions to each other, and to compare them with the length of hand and finger. Not only should the structure of the usual *hairs* be mentioned, but also the arrangement of the longer and more slender "tactile" hairs. Valuable characters are often found in the position of the tactile hairs as well as in the number and arrangement of *accessory teeth* and "*spots*" or "sense-spots," in spite of often considerable variation within the same species.

The *coxae*, especially those of the fourth pair, often provide characters of great interest and should always be examined, the sexual difference, of course, being taken into consideration. In most previous descriptions the *legs* are scarcely mentioned, and the workers on the systematics of this group have not at all realised the importance of these appendages, not only in the definition of groups of species (*cf.* the structure of the first pair of femora, of the claws and subterminal hair, and the position of the



"tactile" hair of tarsus IV.), but also in distinguishing nearly related species (*cf.* for instance *Ch. javanus* Thor. and *Ch. plebejus* With). As a whole, the value of these organs can scarcely be too strongly emphasised, not only when our purpose is the mere determination of a species, but also when we wish to understand its real systematic position; of course, it is not of much value to examine the legs *in situ*: the first and the fourth pair on the right or left side should be dissected off and measured exactly.

The colour of the palps and dorsal surface of the body is sometimes of value, that of the rest of the body is non-important in the description of species.

Finally, it should be emphasised that it is of the greatest interest to determine the sex of the specimen to be examined. So far as the terminology, measurements, &c. are concerned, I refer to my earlier publication (*cf.* 20. pp. 56-58).

#### I. Group of CHELIFER CANCROIDES L.

*Femur of the first pair of legs with wide oblique articular cavity. Chela of the palps without accessory teeth. Real eyes. "Tactile" hair of tarsus IV. well removed from base. ♂ with genital plates of peculiar structure, with long ram's-horn-shaped organs, with coxal sac, and with posterior margin of the coxa concave. (The claws are generally provided with teeth and the subterminal hair is often of peculiar shape. Two distinct transverse grooves, of which the posterior is sometimes the broader. Hairs obtuse or clavate. ♂ generally with tergal lateral keels.)*

For the characteristics of this group I refer to my earlier paper (*cf.* 20. p. 132) and to the above diagnosis; I shall only add that the *subterminal*\* hair is sometimes completely simple (*cf.* the descriptions). The *flagellum* consists of three hairs, and a sexual difference is found in the galea. Twenty species at least of the great number of Chelifers described as having real eyes may with more or less certainty be referred to this group.

From Asia: *Ch. bicarinatus* Sim.; *Ch. bifissus* Sim. (?); *Ch. bisulcus* Thor. (?); *Ch. borneonensis* Ell.; *Ch. depressus* C. K.; *Ch. hians* Thor.; *Ch. mortensenii* With; *Ch. superbus* With; and *Ch. amurensis* Tullgr.

From Africa: *Ch. sculpturatus* Lew.; *Ch. socotrensis* With; *Ch. mucronatus* Tullgr.; and *Ch. torulosus* Tullgr.

From Europe: *Ch. cancroides* L.; *Ch. disjunctus* L. K.; *Ch. hermanni* Leach; *Ch. lamprosalis* L. K.; *Ch. maculatus* L. K.; and *Ch. meridianus* L. K.

From North America: *Ch. biseriatus* Bk. and *Ch. scabicus* Sim.

\* I hope that it will meet with general approbation to designate "the terminal lateral hair" subterminal in the future.



From South America: *Ch. imperator*, sp. n.; *Ch. rex*, sp. n., and *Ch. macropalpus* Tullgr.

From Australasia (Hawaii): *Ch. bifissus* Sim.

As species of this group have never previously been described from South America (the domestic species *Ch. cancroides*, of course, excepted), the occurrence of two curiously developed species is of peculiar interest.

*Synopsis of Species* \*.

- a. Claws of fourth pair of legs with teeth. Tergites of ♂ with lateral keels, and the distinctly gaping fingers of the palps without any process on the inner margin of the movable finger.
  - a<sup>1</sup>. The hand as long as the finger. The tarsus of the first pair of legs in ♂ dorsally without terminal projection . . . . . 1. *Ch. cancroides* L.
  - b<sup>1</sup>. The hand at least 1.4 as long as the finger. Femur 8.5 (♂) or 5.8 (♀) as long as wide. The tarsus of the first pair of legs in ♂ dorsally with terminal projection . . . . . 2. *Ch. imperator*, sp. n.
- b. Claws of fourth pair of legs without teeth. Tergites of ♂ without lateral keels, and the slightly gaping fingers of the palps with a distinct process on inner margin of movable finger. The femur is 4.7 as long as wide. The tarsus of the first pair of legs in ♂ without any terminal projection dorsally. . . . . 3. *Ch. rex*, sp. n.

1. CHELIFER CANCROIDES L.

From South America this widely distributed species has been recorded from Cape Horn (Simon, 6. p. 36), from Tierra del Fuego (Simon, 12. p. 167), and from Pará (Ellingsen, 18. p. 16).

2. CHELIFER IMPERATOR, sp. n. (Plate XXIX. figs. 1 a-i.)

*Male.*

*Cephalothorax*.—One pair of distinctly convex *eyes*. Cephalothorax distinctly longer than wide behind. Two prominent very deep transverse *grooves*, which are almost straight, are present. Cephalothorax uniformly and distinctly granular, but also provided on each side with about 12 small tubercles, which each bear a single short clavate hair.

*Abdomen* (Plate XXIX. figs. 1 a-b).—The abdomen is fairly elongated and depressed, in connection with the cephalothorax showing an elongated egg-shaped circumference. All tergites except the first two with distinct *longitudinal line*. From the first to the eighth the abdominal tergites possess, like the second thoracic, *lateral keels*, which are

\* *Chelifer macropalpus* Tullgr. (23. pp. 26-29, fig. 1) from Haiti is nearly related to *Ch. imperator*, sp. n., but scarcely identical with it on account of smaller size, less slender tibia of the palps, and different structure of claws (posterior claw of first pair of legs possesses a tooth).



blunt anteriorly, but backwards and upwards produced into a fairly acute stylet; the whole structure appears, in the median segments at least, similar to a hatchet; the keel of the ninth segment is only slightly developed and that of the tenth just indicated (fig. 1 *a*). Skin everywhere distinctly *granular*. Tergites bear in a row along the hindmost margin from 12–14 clavate hairs in addition to a single lateral hair in front of the row, which together with the outermost of the row is placed on the lateral keel; the second to the tenth tergites bear also a median hair in front of the row on each side, as well as a single hair between the two mentioned, with the exception of the second and third segments. The eleventh tergite bears in addition to eight hairs, placed in two rows, about 100 small round spots, perhaps seats for minute fissures, and so does the corresponding sternite.

*Antennæ*.—The terminal hair extends distinctly beyond the slender cylindrical *galea*, which possesses two almost obsolete teeth just beyond the middle and three more developed terminally.

*Palps* (Pl. XXIX. figs. 1 *c–d*).—The *maxillæ* are granular all over. Trochanter and femur of palps are distinctly granular, the latter joint less distinctly so ventrally; the two following segments only slightly granular, except in front laterally; in addition to the usual granulations the trochanter bears posteriorly some more rounded small tubercles as well as about five larger conical eminences; on the anterior surface of the femur about 25 triangularly shaped tubercles are observed, while the tibia shows traces only of similar structures. *Hairs* are short; those of trochanter as well as of anterior surface of femur and in a less degree of tibia are slightly clavate, while others are more or less obtuse except pointed ones of fingers; the tubercles just mentioned always possess a single hair. The *trochanter*, which has a long and very well-defined stalk, is 2·3 as long as wide; it is wider than femur or tibia and twice as long as chela is wide; the anterior outline beyond the stalk is slightly convex and then almost straight, while the posterior is produced just beyond the stalk and then distally becomes a little concave. The *femur*, which has a short, well-pronounced stalk, beyond which it is gradually, but most distinctly, widened out towards the extremity, is 8·5 as long as wide; anteriorly, beyond the stalk and a short basal elevation, marked off from each other by a low notch, it is slightly concave, while posteriorly beyond the stalk it is slightly convex, and then straight, or even a trifle concave. The *tibia*, which is distinctly shorter and a little wider than the femur, has a short fairly well-defined stalk and is gradually and distinctly widened out towards the tip; it is almost eight times as long as wide terminally; the outline beyond the rather shallow notch of stalk is almost straight and then a trifle concave anteriorly, but posteriorly beyond the small condylus and the elongated badly defined basal elevation it is moderately concave and then convex but for a slight concavity terminally. The *chela* is seven times as long as wide; the *hand*, which is much shorter than the tibia and 1·4 as wide, is 4·2 as long as wide, as wide as deep, and 1·5 as long as the finger. The *fingers* gape very distinctly when



closed, as both those movable and, in a less degree, those immovable are concave in the middle and bear on the distal fifth, where they touch each other, a close row of conical teeth. In addition to this the movable fingers possess about five marginal teeth in the middle, and the immovable six teeth in the middle and five more basally. The immovable fingers bear anteriorly about seven "*spots*," arranged as shown in figure 1 *d*, and the movable fingers about 15 arranged longitudinally from base to tip; both fingers appear to have numerous spots on the posterior surface, but details could not be investigated in the single specimen at my disposal.

*Coxæ* (Pl. XXIX. fig. 1 *b*).—The second and third pair of somewhat irregular shape, widened out towards the extremity and rather elongated—especially the third pair, which in shape somewhat resemble the fourth pair, which are almost 2·5 as long as wide, very short basally and distinctly widened out towards the end, where they bear a prominent exterior spine. The posterior margins of the fourth pair are distinctly concave in the middle.

*Coxal sac*.—The coxal sac is very small and is far from filling the whole coxa; in structure it is very similar to that of *Ch. mortensenii* With, as it has a well-developed basal portion, scarcely half as long as the distal; posteriorly the two portions pass into each other, but are separated anteriorly by a deep cleft, continued above and below into a shallow depression. As regards the structure of the funnel, which has some of the fused hairs prolonged into the cavity of the distal sac (*cf.* 21. pl. vii. fig. 4 *f*), I refer to *Ch. mortensenii* With (20. pp. 46–47). The distal portion of the sac tapers somewhat towards the end, where it bears numerous setigerous cones and ridges, which, towards the base, are most marked on the anterior surface.

*Legs* (Pl. XXIX. figs. 1 *e–f*).—Hairs short, especially dorsal ones, obtuse or slightly clavate. *Subterminal* hairs of the first pair bear no teeth; the anterior is shorter and more suddenly curved (fig. 1 *f*, *hi*) in contrast to the posterior, which is more slender and only slightly curved (*he*); the posterior subterminal hair of the fourth pair is slender and moderately curved, with a tiny ventral tooth near the tip. A tarsal "*tactile*" hair,  $\frac{3}{4}$  removed from the tip, seems to be present. The legs are rather long and slender; the trochanter of the first pair is much deeper than the femur proper, probably in correspondence with the very wide articular cavity; the tibia is much (1·3) longer than the *tarsus*, which is about four times as long as deep in the middle, where it is deepest on account of the slightly convex ventral margin; this joint is terminally behind and above the articulation of the claws, produced into a small conical eminence (*p*). The *femur* of the fourth pair of legs, which is very suddenly raised beyond the stalk, is 2·8 as deep as long, 1·3 as long as tibia, and 1·4 lower than tarsus long. The anterior *claw* of the first leg (fig. 1 *f*, *ci*) is abruptly curved, with a median, almost obsolete, ventral tooth, in contradistinction to the posterior claw (*ce*), which is only moderately curved, without any tooth; the claws of the second pair of legs appear bifurcate, while those of the third and fourth pair possess a rather small anterior tooth.



*Colour*.—The palps are reddish brown; the body is darker brown, with almost black lateral keels.

*Measurements*.—Cephalothorax 1.10 (0.920); abdomen 2.19 (1.38) mm.

Palps: trochanter 0.736 (0.322); femur 2.162 (0.253); tibia 2.070 (0.263); hand 1.541 (0.368), depth 0.370; finger 1.035 mm.

Leg I.: femur 0.70 (0.190), trochantin 0.130 (0.213); tibia 0.486 (0.129); tarsus 0.380 (0.099) mm.

Leg IV.: femur 0.930 (0.334); tibia 0.699 (0.167); tarsus 0.471 (0.106) mm.

#### *Female.*

*Cephalothorax*.—The transverse grooves, especially the posterior, are less distinctly marked.

*Abdomen*.—The abdomen is less depressed; the second to the tenth tergites with distinct longitudinal line and the first and last tergites with trace of one. Tergal longitudinal keels are wanting. Number of hairs is somewhat greater; in the hindmost marginal row, for instance, 14–16 are found.

*Antennæ*.—The terminal hair extends scarcely beyond the galea, which terminally bear about four short teeth.

*Palps* (Pl. XXIX. figs. 1 *g–h*).—The *maxillæ* are only distinctly granular laterally. The *trochanter*, which has a rather short, but well-defined stalk, is only 1.7 as long as wide, and 1.3 as long as chela is wide; anterior outline is slightly convex, while the posterior, beyond the stalk, is rather suddenly produced into a conical tubercle somewhat dorsally placed. The *femur* is only 5.8 as long as wide and is less widened out towards the extremity. The *tibia* is almost as in the male, but only 4.3 as long as wide. The *chela* is 4.4 as long as wide; the *hand* is only 2.6 as long as wide, but 1.4 longer than the finger; the fingers (fig. 1 *h*) gape slightly when closed and are provided with marginal teeth from base to tip. The number of “spots” is almost the same as in the male, but they are somewhat smaller anteriorly; the immovable finger has posteriorly about five “spots,” arranged between two basal and the median tactile hairs, and the movable has about ten “spots” arranged in a longitudinal area between and beneath the tactile hairs (*cf.* fig. 1 *h*).

*Coxæ* (Pl. XXIX. fig. 1 *i*).—As regards the difference from the male, I refer to fig. 1 *i*.

*Legs*.—The *claws* of the first pair of legs possess large anterior teeth. The *tibia* of the first pair of legs is only 1.2 as long as the tarsus, which gradually tapers towards the end, where no dorsal conical process is found, and attains a length 4.5 times its depth. The *femur* of the fourth pair is three times as long as deep and 1.6 lower than tarsus is long.

*Colour*.—The palps and, more markedly, the body somewhat lighter.



*Measurements.*—Cephalothorax 1.06 (0.88); abdomen 1.84 (1.27) mm.

Palps: trochanter 0.552 (0.322); femur 1.472 (0.253); tibia 1.288 (0.299); hand 1.127 (0.437), depth 0.437; finger 0.805 mm.

Leg I.: femur 0.638 (0.190), trochantin 0.122 (0.198); tibia 0.456 (0.122); tarsus 0.395 (0.089) mm.

Leg IV.: femur 0.836 (0.296); tibia 0.646 (0.160); tarsus 0.456 (0.122) mm.

*Material.*—Of this very interesting species from Brazil I have examined two specimens, a male and a female.

*Remarks.*—It is not without hesitation that I have referred the two specimens (♂ ♀) to the same species, as the differences in their whole appearance are so striking, and as the finger of the female is somewhat longer than in the male, while the contrary is generally the rule; but as they were found together, and as great similarity is found in the structures which are not subject to sexual variation, I think that the course I have taken is the best one. They differ from *Ch. cancroides* L. in the hand, which is much shorter than tibia and longer than finger, together with numerous other characters taken from minute structure of claws, coxal sac, &c.

### 3. CHELIFER REX, sp. n. (Plate XXIX. figs. 2 a-e.)

#### *Male.*

*Cephalothorax.*—One pair of fairly distinct convex *eyes*. Cephalothorax as long as wide behind. Two not very prominent, almost straight transverse *grooves* present. Cephalothorax uniformly and distinctly granular everywhere, but besides on each side provided with at least 20 very small tubercles, each bearing a single very short and distinctly clavate hair.

*Abdomen.*—The abdomen is moderately slender and depressed, with almost parallel sides. All tergites except the hindmost part of the eleventh with distinct *longitudinal line*. Tergites without trace of longitudinal lateral *keels*. Skin everywhere distinctly *granular* with scale-shaped granules. The first to the eighth tergites each bear along the hindmost margin a row of 14 short, distinctly clavate hairs, while the ninth and the tenth bear only ten or twelve; the third tergite bears in addition to those in the row a lateral hair on each side, in front of the row, while all the following segments bear six hairs in front. The eleventh tergite bears about eight hairs and a number of small round spots, and so does the corresponding sternite (cf. *Ch. imperator*, sp. n., in which the number appears to be greater).

*Antennæ.*—The terminal hair extends very markedly beyond the *galea*, which is short, suddenly attenuated in terminal third, with three short terminal teeth.

*Palps* (Pl. XXIX. figs. 2 a-c).—The *maxillæ* are scarcely granular at all in the middle, but fairly distinctly so laterally. The palps, with the exception of the fingers, are distinctly granular, especially the three basal joints laterally and above;



the trochanter has in addition to the usual granulations small round tubercles as well as three or four larger eminences; the anterior surface of the femur shows traces at least of similar, though much smaller tubercles, which, like those of the trochanter, carry a single hair. *Hairs* are rather short; those of the trochanter and of the femur, at least dorsally and anteriorly, as well as those of the anterior surface of the tibia, are more or less distinctly clavate, while a few on the posterior surface of the femur, those on the posterior surface of the tibia, as well as those on the hand, are obtuse with one or several terminal teeth; fingers with completely simple and pointed hairs in addition to the tactile ones. The *trochanter*, which has a rather short, but very well-defined stalk, is 1·8 as long as wide; it is wider than the femur as well as the tibia and 1·4 as long as the chela is wide; its anterior outline beyond the stalk is moderately convex, while posteriorly it is slightly convex on the ventral surface, but distinctly produced on the dorsal. The *femur* has a short and fairly well-defined stalk, beyond which it is gradually and fairly distinctly widened out towards the end. It is 4·7 as long as it is wide; anteriorly, beyond the stalk and a scarcely marked short convexity, it is almost straight (or even a little concave), while posteriorly it is slightly convex basally and terminally, but almost straight between. The *tibia*, which is much shorter and a little wider than the femur, has a fairly long and well-defined stalk and is gradually widened out distally; it is 3·4 as long as broad; the anterior outline beyond the stalk is very slightly convex, while the posterior one beyond the insignificant condylus and elongated basal elevation is at first almost straight and then a little convex. The *chela* is 4·4 as long as wide; the *hand*, which is somewhat shorter than the tibia and 1·4 as broad, is almost 2·3 as long as wide, much broader than deep and scarcely 1·1 as long as finger; the lateral outlines are very slightly convex, with the greatest width just beyond the base. The *fingers* gape moderately when closed and have along the margins a row of conical teeth (fig. 2 *b*); the margin of the movable finger has near to the base a ventral elongated *elevation* (*pv*) and opposite to this another much more pronounced dorsal one, bearing about five teeth and fitting into a depression or swelling of the immovable finger (figs. 2 *b-c*, *pd*), the margin of which is accordingly curved outwards; the immovable finger has just beyond this depression posteriorly near the dentated margin a small tubercle (*pi*). The immovable finger bears anteriorly six and the movable five "*spots*," while both fingers posteriorly bear three spots, arranged as shown in the figure (fig. 2 *c*).

*Coxæ* (Pl. XXIX. fig. 2 *d*).—They are less elongated than in the preceding species (*cf.* above), especially the third pair, which are as broad as the second interiorly, and not very much widened out; the fourth are long and slender and distinctly widened out from a very short base towards the extremity, where they are scarcely as wide as the third pair; the exterior spine of the fourth pair is represented only by an insignificant short process (*s*), and the posterior margin is almost obtuse-angled.

*Coxal sac* (Pl. XXIX. fig. 2 *d*).—The coxal sac is small, only about one-third as



long as the whole coxa and only occupying an inconspicuous portion of it. Its basal portion, which is almost half as long as the distal, seems in structure to be similar to that of *Ch. mortensenii* With, but has that part of the funnel which consists of fused "cones" very long. The distal portion of the sac is distinctly attenuated from the base, which is wider than the basal portion towards its end; about 15 long and slender setigerous cones, with their hairs directed towards the base and the interior of the sac, are placed along the anterior surface only; the ridges are only poorly developed.

*Legs* (Pl. XXIX. fig. 2 e).—Hairs of the dorsal surface are rather short, slightly clavate or obtuse; those of the ventral side are generally long and slender, almost simple or completely so. Of the *subterminal* hairs only the anterior of the first pair, which is rather straight and apparently with a single tooth, and the anterior of the fourth pair, which is moderately curved and without teeth, are present. A tarsal "tactile" hair  $\frac{3}{4}$  removed from the base seems to be present. Legs are fairly long and slender; the trochantin of the first pair of legs is much deeper than the femur proper, probably in correspondence to a very wide articular cavity; the *tibia* is scarcely 1.1 as long as the *tarsus*, which is 3.6 as long as deep and gradually attenuated towards the tip from the base, where dorsal and ventral margins are slightly convex. The *femur* of the fourth pair of legs, which is fairly suddenly raised beyond the stalk, is 2.3 as long as deep, 1.3 as long as tibia, and 1.2 lower than tarsus deep. *Claws* bear no teeth; the posterior of first pair much more slender and moderately curved.

*Colour*.—Palps and cephalothorax generally dark reddish brown; abdominal tergites brown.

*Measurements*.—Cephalothorax 0.92 (0.92); abdomen 1.73 (1.15) mm.

Palps: trochanter 0.506 (0.280); femur 1.081 (0.230); tibia 0.897 (0.265); hand 0.828 (0.368), depth 0.330; finger 0.782 mm.

Leg I.: femur 0.559 (0.160), trochantin 0.114 (0.182); tibia 0.380 (0.129); tarsus 0.357 (0.099) mm.

Leg IV.: femur 0.737 (0.327); tibia 0.585 (0.152); tarsus 0.403 (0.098) mm.

#### *Female.*

*Cephalothorax &c.*—The cephalothorax is a little longer than wide; transverse grooves, especially hinder, less distinct; the *abdomen* is more cylindrical in shape.

*Antennæ*.—The terminal hair scarcely extends beyond the *galea*, which has a few terminal teeth.

*Palps*.—The *trochanter* is 1.6 as long as wide and of a less slender appearance; the other joints scarcely different from corresponding ones of the other sex. The arrangement of the *spots* anteriorly only differs from the male in mere details; the immovable finger has the fourth "spot" placed beyond the median hairs and the two following close together, while the movable has only three spots, two basally and a



single one more apart; posteriorly the three "spots" on the movable finger stand more apart. The fingers do not touch each other in the middle when closed, but leave a narrow space between.

*Coxæ*.—The fourth pair are very similar to those of the preceding species, but even shorter (*cf.* fig. 1 i).

*Legs*.—*Subterminal* hair of the first pair is rather suddenly broken or curved without any tooth anteriorly, while posteriorly it, as in the fourth pair, is moderately curved. The *tarsus I.* is much more slender, being 5·7 as long as deep; the femur of the fourth pair of legs is 2·5 as long as deep and 1·4 lower than tarsus long. The posterior *claw* of the first pair of legs is more slender and less curved than the other claws, but in a smaller degree than in the male.

*Measurements*.—Cephalothorax 1·08 (1·04); abdomen 2·53 (1·38) mm.

Palps: trochanter 0·529 (0·322); femur 1·219 (0·253); tibia 0·989 (0·299); hand 0·920 (0·414), depth 0·368; finger 0·898 mm.

Leg I.: femur 0·631 (0·175), trochantin 0·122 (0·190); tibia 0·410 (0·114); tarsus 0·388 (0·067) mm.

Leg IV.: femur 0·820 (0·330); tibia 0·646 (0·167); tarsus 0·471 (0·084) mm.

*Material*.—Of this species I have examined five males and one female, as well as an immature specimen from Brazil.

*Remarks*.—That the female and the males belong to the same species I regard as certain. I am not quite convinced that the males are quite full-grown, as the first abdominal tergite is longitudinally divided as in the female, while the male of *Lophochernes* has generally the first two tergites undivided; but as well-marked sexual characters are present in the coxæ, tarsi, and maxillar chelæ, I think they are probably mature. This species, which is most remarkable by the curious structure of the male chela, is easily distinguished from *Ch. imperator*, sp. n., as well as from *Ch. cancroides* L., by the unarmed claws.

## II. Group of CHELIFER SUBRUBER Sim.

*Articular cavity between the two parts of the femur of the first pair of legs not very wide and only slightly oblique, with posterior condylus placed more ventrally than anterior. Fingers of the palps without accessory teeth. Real eyes or ocular spots. "Tactile" hair of tarsus IV. never basal. Male with genital plates of simple structure and its median sternites with differently developed spinous areas.*

*(Claws simple and subterminal hair never with teeth. Two distinct transverse grooves.*

*Hairs slightly or strongly clavate. Flagellum consists of four hairs.)*

The characteristics of this group are in the main as set forth in my earlier publication on this theme (*cf.* 20. p. 133). The *eyes* are real or represented by ocular spots; sometimes we find eyes in the females, but ocular spots in the male—for instance, in *Ch. longichelifer* Balz. The *cephalothorax* is more or less granular, with two



distinct transverse *grooves*. The tergal sclerites are also granular, with more or less distinctly clavate hairs along the hindmost row in addition to hairs (generally six) in front of the row in the median segments at least. The *genital area* of the male is very similar to that of *Ch. subruber* Sim. (*cf.* 20. p. 121, pl. iii. fig. 7 *b*); the anterior plate, which is wider than long, has a posterior marginal seam, and is shorter, as well as narrower, than the posterior plate; a great number of accessory club-shaped glands are present. The sternites of the males are beset with short *spines*, arranged in well-defined areas; the number of the spines on each segment, the shape of the area in which they are placed, and the number of the sternites, which are adorned with such areas, vary considerably in different species: in *Ch. murrayi* Poc. the fourth to the tenth sternites bear numerous spines, and in *Ch. canestrinii* Balz. only the seventh and the eighth sternites bear areas of a somewhat remarkable structure (*cf.* Ellingsen, 32. pp. 13-14; With, 20. pp. 129, 158, & 162, tab. iii. figs. 7 *b* & 8 *b*; also Pl. XXIX. figs. 3 *a*, 5 *a*, & 6 *a*) \*. The *galea* in the female of the South-American species is long and slender, distinctly extending beyond the terminal hair and provided with about five terminal branches, while in the male it extends scarcely at all beyond the terminal hair and its teeth are more or less obsolete; in the two Asiatic species examined the *galea* has a somewhat different structure (*cf.* 20. tab. iii. figs. 7 *d* & 8 *c-d*). The *flagellum* always consists of four hairs (*cf.* 20. p. 158). The *palps* are generally longer and more slender in the males than in the females, but seldom in so marked a degree as in *Ch. longichelifer* Balz.; the fingers never bear accessory teeth and seldom gape distinctly in the male. The *articulation* between the two parts of the femur of the first pair of legs is very similar to that of *Ch. subruber* Sim., but seems to be somewhat better developed (*cf.* 20. p. 37, figs. 5 *a*, *b*). The articular cavity is not very wide, slightly oblique, with the anterior and posterior condyli opposite to each other, or the latter more dorsally placed. The subterminal hair has no tooth, and the dorsal "tactile" hair of the fourth pair of legs is median or placed beyond the middle; the proximal joints of the legs are more or less granular, and the claws are always simple.

The following 14 species may with certainty be referred to this group, but without doubt the number will be largely augmented by described as well as undescribed species, when naturalists, working at this group, have realised the value of a more thorough investigation. I am disposed to think that the group of *Ch. subruber* Sim. is the central one of the whole subfamily, but before settling the question definitely a comparative-anatomical investigation of the male organs of the different types of *Chelifer* Geoff., as well as of the *Garypidæ* Hans., is absolutely necessary.

From South America: *Chelifer canestrinii* Balz.; *Ch. exilimanus* Balz.; *Ch. insignis*,

\* Alb. Tullgren (23. p. 33) writes about *Ch. torulosus* Tullgr., which belongs to the group of *Ch. can-croides* L.:—"Die vordere Ventralplatten scheinen daneben eine transversale Area kurzer Stacheln (wie *Ch. angulatus* Ell.) zu besitzen."



sp. n.; *Ch. longichelifer* Balz.; *Ch. nobilis*, sp. n.; *Ch. proximus* Ell. (?); *Ch. rufus* Balz.; *Ch. satanas*, sp. n.; *Ch. segmentidentatus* Balz.; *Ch. emigrans* Tullgr.

From Europe: *Ch. subruber* Sim.

From Asia: *Ch. subruber* Sim.; *Ch. murrayi* Poc.

From Africa: *Ch. angulatus* Ell.; *Ch. simoni* Balz.; *Ch. tenuimanus* Balz. (?); *Ch. angustatus* Tullgr.; *Ch. concinnus* Tullgr.; *Ch. facetus* Tullgr.; *Ch. lamellatus* Tullgr.; and *Ch. termitophilus* Tullgr.

From Australia: *Ch. subruber* Sim.

### *Synopsis of Species* \*.

- a. Hand 1.1 as long as finger or shorter.
  - a<sup>1</sup>. Second thoracic tergite with two white spots. Ocular spots.  
Chela is 3.5 as long as wide; hand at least 1.1 as long as tibia.  
Femur IV. 2.5 as long as deep . . . . . 6. *Ch. nobilis*, sp. n., ♂.
  - b<sup>1</sup>. Second thoracic tergite unicolor.
    - a<sup>2</sup>. Real eyes. Chela at least 3.4 as long as wide. ♂ tergites not serrated and fingers of palps scarcely gaping. Femur IV. 2.7-3 as long as deep.
    - a<sup>3</sup>. Fingers 1.25 as long as hand, which is distinctly shorter than the tibia. Maxillæ almost smooth . . . . . 4. *Ch. proximus* Ell.
    - b<sup>3</sup>. Fingers not more than 1.1 as long as hand.
      - a<sup>4</sup>. Tibia 1.2 longer than the hand. Maxillæ distinctly granular all over. Femur 5.4 (♂) or 4 (♀) as long as wide and the hand as long as finger. Hairs distinctly clavate. VII.-IX. sternites (♂) with spinous areas not circular and with spines apart . . . . . 5. *Ch. rufus* Balz.
      - b<sup>4</sup>. Tibia as long as hand. Maxillæ almost smooth. Femur 3.7 as long as wide and hand about 1.1 as long as finger. Hairs slightly clavate. VII.-VIII. sternites (♂) with a single one or a pair of circular areas with spines (?) close together . . . . . 7. *Ch. canestrinii* Balz., ♂.
  - b<sup>2</sup>. Ocular spots. Chela 2.8-3 as long as wide. Tergites of ♂ with hindmost margin serrated, and fingers of palps distinctly gaping. Femur IV. 2-2.2 as long as deep.
    - a<sup>5</sup>. Trochanter beneath with long conical process . . . 10. *Ch. satanas*, sp. n., ♂.
    - b<sup>5</sup>. Trochanter beneath without a conical process . . . 9. *Ch. segmentidentatus* Balz.
- b. Hand at least 1.2 as long as finger.
  - a<sup>6</sup>. Femur with basal anterior apophysis; hand 1.1 as wide as tibia and 1.7 as long as finger . . . . . 12. *Ch. exilimanus* Balz.

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\* *Chelifer emigrans* Tullgr. (23. pp. 35-36, fig. 5), from Brazil, certainly belongs to this group. It is similar to *Ch. insignis*, sp. n., by number of tergal hairs in front of row, but differs by wider abdomen and more slender palps.



*b*<sup>6</sup>. Femur without basal apophysis.

*a*<sup>7</sup>. Median abdominal tergites with 8 hairs in front of row. Real eyes. Chela is 3 as long as wide; hand is 1·3 as long as tibia and 1·3 as long as finger. . . . . 11. *Ch. insignis*, sp. n., ♀.

*b*<sup>7</sup>. Median abdominal tergites with 6 hairs or less in front of row.

*a*<sup>8</sup>. Femur is 6·3 as long as wide and distinctly widened out towards the extremity. Hand is 1·5 shorter than tibia and 1·5 as long as the finger . . . . . 8. *Ch. longichelifer* Balz., ♂.

*b*<sup>8</sup>. Femur not more than 4 as long as wide. Hand 1·2 shorter than tibia and 1·3 as long as finger or less.

*a*<sup>9</sup>. Femur at least 3·5 as long as wide and tibia at least 3 as long as wide. Femur IV. at least 2·5 as long as deep.

*a*<sup>10</sup>. Chela at least 3·5 as long as wide. Hand only 1·2 as long as finger.

*a*<sup>11</sup>. Hand as long as tibia. Hairs slightly clavate. Second thoracic tergite unicolor. Real eyes. 7. *Ch. canestrinii* Balz., ♀.

*b*<sup>11</sup>. Hand much shorter than tibia. Hairs distinctly clavate. Second thoracic tergite with two white spots. Ocular spots . . . . . 6. *Ch. nobilis*, sp. n., ♀.

*b*<sup>10</sup>. Chela 3·1 as long as wide. Hand 1·3 as long as finger, and 1·1 shorter but 1·6 wider than tibia. Ocular spots (?) . . . . . 8. *Ch. longichelifer* Balz., ♀.

*b*<sup>9</sup>. Femur 3·2 as long as wide and tibia about 2·5 as long as wide. Chela 2·8 as long as wide; hand 1·2 as long as finger. Femur IV. 2·2 as long as deep. Ocular spots.

9. *Ch. segmentidentatus* Balz., ♀.

## 4. CHELIFER PROXIMUS Ell.

1905. Ellingsen, (19) pp. 324–326.

This species agrees in almost every respect, so far as Mr. Ellingsen's description goes, with *Ch. nobilis*, sp. n., except that it is somewhat smaller, that the fingers are 1·25 as long as the hand, instead of nearly equal to it, and that the second thoracic tergite has no white spots.—Argentine.

5. CHELIFER RUFUS Balz. (Plate XXIX. figs. 3 *a-e*; text-fig. 64.)

1890. Balzan, (10) pp. 431–432, tav. xv. figs. 15–15 *b*.

1891. Balzan, (11) pp. 533–534, pl. xi. fig. 25.

1902. Ellingsen, (15) pp. 158–159.

1907. Tullgren, (23) p. 37.

*Male.*

*Cephalothorax*.—Fairly distinct, moderately curved. Real eyes. Cephalothorax distinctly longer than wide behind. Two fairly distinct, almost straight transverse



grooves. Distinctly and coarsely granular all over; strongly clavate hairs, somewhat similar to scales of a butterfly, found in numbers.

*Abdomen* (Pl. XXIX. fig. 3 *a*).—All tergites longitudinally divided, but the first three very indistinctly so. Sclerites as well as lateral dorso-ventral margin distinctly granular. About 10 strongly clavate hairs are placed along posterior margin, and 4–6 in front of row on the hindmost (VI.–X.) tergites; XI. tergite bears in addition to two rows of clavate hairs a pair of not very long simple “tactile” hairs (*cf.* Ellingsen, 15. p. 158). About *genital area*, *cf.* p. 229.

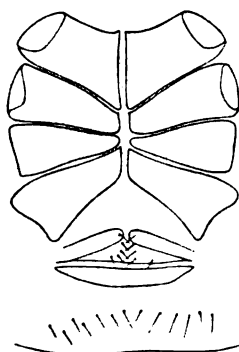
The IV.–VI. *sternites* are longitudinally divided and so are sometimes the X.–XI.; the VIII. sternite is undivided or shows a trace of longitudinal division in anterior fifth only; the VII. is either completely divided or shows only trace of division anteriorly and so generally does the IX. sternite. The sternites are smooth in the middle, but granular laterally. The VIII. sternite is longer than any of the others and has in the middle an almost semi-ellipsoidal pale area, which has its anterior convex margin fairly well marked off from the surrounding darker skin, and its hinder margin, which is a trifle convex, fairly well raised and distinctly chitinised; this area occupies  $\frac{1}{3}$  of breadth of the sternite and  $\frac{3}{4}$  of its length. It possesses in addition to the usual hairs about 50 short spines, placed within well-marked rings, crowded in the middle but standing more apart laterally. The VII. and IX. sternites show areas of similar appearance, possessing about 15 or 20 spines respectively, but less distinctly limited laterally; but these areas almost disappear in specimens in which the corresponding sternites are completely divided, and the spines are then placed interiorly near the posterior margin in each half of the sclerite (fig. 3 *a*). In this species it thus seems evident that the spinous area forms part of the sclerite and does not stand between its two halves.

*Antennæ*.—The terminal hair extends beyond the short acute *galea* without distinct teeth (*cf.* Ellingsen, 15. p. 159).

*Palps* (Pl. XXIX. fig. 3 *b*).—The *maxillæ* are distinctly granular all over and so are the palps with the exception of the fingers. Hairs strongly clavate and rather short on trochanter and femur, less distinctly so on tibia and hand. The *trochanter*, which has a short, but well-defined stalk, is 1.5 as long as wide; the anterior outline is distinctly convex, while posteriorly it is produced ventrally, and even more so dorsally, so that it appears bigibbose. *Femur* has a short, not well-limited stalk, beyond which it is distinctly widened out towards the tip. It is almost 5 as long as wide; anteriorly beyond a very short basal elevation it is very slightly concave; posteriorly it becomes gradually convex just beyond the stalk and towards the termination, but between it is almost straight. The *tibia*, which is distinctly shorter and wider than the femur, has a short, very well-defined stalk and is 3.3 as long as wide; the anterior outline beyond the stalk is slightly convex, with the greatest curvature near the base, terminally it even becomes a trifle concave; posteriorly beyond the low condylus and fairly well-marked basal elevation it is slightly concave and then terminally moderately convex.

The *chela* is 3·7 as long as wide; the hand, which is distinctly narrower than the trochanter is long, is 1·2 shorter but 1·4 wider than tibia, is almost 1·8 as long as wide, distinctly wider than deep, and scarcely as long as fingers, which only gape a trifle, when closed. The *immovable* finger possesses anteriorly only a single "*spot*," placed just beyond and beneath the third tactile hair, which is placed almost in the middle; the immovable finger has three spots posteriorly and the movable two only, arranged as figured (fig. 3 *b*).

Text-fig. 64.



*Ch. rufus* Balz., ♂. Coxæ and sexual area. × 57.

*Coxæ* (text-fig. 64).—The second pair are distinctly widened out from the rather short interior margin and become rather suddenly attenuated towards the base, while the third pair are distinctly triangular, the inner margin being a mere point. The fourth pair are fairly long and distinctly widened out, of somewhat triangular appearance, as the fairly long interior margin is not well limited from the much longer moderately concave posterior one; the anterior margin is also somewhat concave basally.

*Legs* (Pl. XXIX. figs. 3 *c-e*).—Proximal joints, at least, with scale-shaped granules; the hairs are moderately long and more or less strongly clavate dorsally except in tarsus terminally; ventrally they vary from distinctly clavate to pointed and almost simple. A short "*tactile*" hair is present on tarsus IV.,  $\frac{3}{4}$  removed from the base. The *trochantin* of the first pair of legs is somewhat wider than the femur proper, and the articulation is poorly developed, only with an anterior median tooth as well as a posterior more dorsally placed, where the margin of the trochantin overlaps the base of the following joint. The *tarsus*, which is of almost equal length with the tibia, is distinctly 5 as long as deep. The *femur* of the fourth pair of legs, which is raised fairly gradually beyond the stalk, is three times as long as deep, scarcely 1·1 as long as tibia, and almost 2·5 as low as tarsus is long.

*Colour*.—Palps are reddish brown, and body, especially cephalothorax, darker brown.

*Measurements*.—Cephalothorax 0·690 (0·598); abdomen 1·196 (0·805) mm.

Palps: trochanter 0·299 (0·184); femur 0·690 (0·138); tibia 0·598 (0·184); hand 0·483 (0·265), depth 0·230; finger 0·483 mm.

Leg I.: femur 1. 0·365 (0·114), trochantin 0·099 (0·120); tibia 0·296 (0·076); tarsus 0·296 (0·056) mm.

Leg IV.: femur 0·456 (0·152); tibia 0·426 (0·091); tarsus 0·372 (0·068) mm.

#### Female.

*Abdomen &c.*—Number of hairs along posterior margin of tergites greater (viz. 12), and often also a greater number in front of row. The *galea* is longer and more slender, with six terminal teeth, and distinctly extending beyond the terminal hair (*cf.* Balzan's fig. 15 *a*, ♀).



*Palps* are less slender; the femur and tibia, for instance, being 4 and 3 times as long as wide respectively; the chela is 3·4 as long as wide; the hand is comparatively broader and perhaps a little longer than the finger; "spots" are anteriorly as in the male.

*Coxæ*.—The fourth pair are perhaps less widened out; interior margin better marked and posterior less concave.

*Legs*.—The legs are somewhat less slender, except the *tarsus* of the first pair, which is 5·5 as long as deep and a trifle longer than the tibia. The *femur* of the fourth pair of legs is scarcely 3 as long as deep and only 2·1 lower than tarsus long.

*Measurements*.—Cephalothorax 0·690 (0·575); abdomen 1·725 (0·920) mm.

Palps: trochanter 0·345 (0·230); femur 0·736 (0·184); tibia 0·647 (0·220); hand 0·552 (0·322), depth 0·280; finger 0·529 mm.

Leg I.: femur 0·418 (0·133), trochantin 0·106 (0·140); tibia 0·319 (0·084); tarsus 0·334 (0·061) mm.

Leg IV.: femur 0·517 (0·182); tibia 0·464 (0·106); tarsus 0·380 (0·068) mm.

*Material*.—Dr. F. Meinert collected 5 males and 5 females of this pretty little species in Venezuela from June to December.

The species has been recorded by previous authors from practically the whole of South America, viz. Argentine, Paraguay, Brazil, Venezuela, and Ecuador.

*Remarks*.—The male is easily distinguished from all other species of this group hitherto described by the structure of the sternal areas; the female may be most easily distinguished from other species with finger of almost equal length to the hand by the distinctly granular maxillæ and tibia, which latter is longer than the hand (*cf.* Ellingsen, 19. pp. 325–326).

#### 6. CHELIFER NOBILIS, sp. n. (Plate XXIX. figs. 4 *a–b*.)

*Cephalothorax*.—Eyes are, in the specimen examined, represented by rather indistinct *ocular* spots. Cephalothorax distinctly longer than wide behind. Two almost straight *transverse grooves*, of which the posterior is rather inconspicuous. Distinctly and coarsely granular all over and provided with short strongly clavate hairs.

*Abdomen*.—All tergites with indistinct longitudinal line. Skin moderately granular; short, distinctly clavate hairs, probably 10 in number, along the hindmost margin together with a few in front of the row. The sternites are longitudinally divided, except the VII.–VIII., which have the median fourth covered by a pale area, about two-thirds of the sternite in length. These areas are irregularly and rather indistinctly limited in front, but fairly well-defined behind, as they here form part of the hinder margin of the sclerite. The eighth sternite is not so well chitinised as in *Ch. rufus* Balz. (*cf.* above). Number of spines 25 and 50.

*Antennæ*.—The *galea* is rather short and thick, with about five short terminal teeth, and extends perhaps in a slight degree beyond the terminal hair.

*Palps* (Pl. XXIX. figs. 4 a-b).—The *maxillæ* are almost smooth in the middle, but granular laterally; the palps are distinctly granular all over, with the exception of the fingers and part of the hand on the under surface. The hairs are fairly long and moderately clavate on the trochanter and femur; these hairs pass gradually into those of the tibia and hand, which are slightly clavate or obtuse. The *trochanter*, which has a short and well-defined stalk, is 1.7 as long as wide; the anterior outline is distinctly convex, while the posterior is slightly produced ventrally and dorsally rises into a rather high, strongly rounded protuberance. The *femur* has a fairly long, badly defined stalk, beyond which it is distinctly widened out to a point somewhat behind the middle. It is about 4 times as long as wide; anteriorly beyond a low and short basal elevation it is moderately concave, while posteriorly it becomes gradually slightly convex just beyond the stalk and again towards its termination, but between it is almost straight. The *tibia*, which is distinctly wider and shorter than the femur, has a fairly long and well-defined stalk and is about 3 as long as broad; the anterior outline beyond the stalk is very slightly convex and then towards the tip a trifle concave, while the posterior beyond the condylus and elongated fairly distinct basal elevation is straight or slightly concave and then moderately convex. The *chela* is 3.5 as long as wide; the *hand*, which is distinctly narrower than the trochanter is long, is scarcely 1.2 as short as but 1.5 as wide as tibia; it is 1.8 as long as wide, distinctly wider than deep, and scarcely 1.1 as long as fingers, which scarcely gape when closed. *Anteriorly* no “spots” were observed, but posteriorly the immovable finger has three and the movable one, as figured (fig. 4 b).

*Coxæ*.—The coxæ scarcely differ from those of *Ch. rufus* Balz. (cf. text-fig. 64).

*Legs*.—The femora and tibiæ, at least, with scale-shaped granules; the hairs are fairly long and dorsally more or less distinctly clavate; most distinctly so in the femur and tibia of the fourth pair of legs; ventrally they are pointed and almost or completely simple. The trochanters as well as the trochantins of the legs possess a longer and more slender hair on the ventral surface. A tarsal “*tactile*” hair is present  $\frac{3}{4}$  removed from the base and a little longer than distance to tip. The *trochantin* of the first pair of legs is somewhat wider than the femur proper and has an articulation like that in the preceding species. The tibia, which is rather short and clumsy, is 1.1 as long as the *tarsus*, which is 4.4 as long as deep. The *femur* of the fourth pair of legs is 2.5 as long as deep, 1.1 as long as tibia, and 1.6 lower than tarsus long.

*Colour*.—Palps are reddish brown. Cephalothorax is dark brown, with two yellowish spots on second tergite; the abdominal tergites are lighter brown, each with a yellowish spot on each half.

*Measurements*.—Cephalothorax 0.805 (0.647); abdomen 1.610 (0.920) mm.

Palps: trochanter 0.391 (0.230); femur 0.805 (0.195); tibia 0.713 (0.230); hand 0.621 (0.345), depth 0.299; finger 0.575 mm.



Leg I.: femur i. 0.448 (0.160), trochantin 0.106 (0.167); tibia 0.334 (0.106); tarsus 0.304 (0.068) mm.

Leg IV.: femur iv. 0.585 (0.228); tibia 0.509 (0.133); tarsus 0.372 (0.076) mm.

*Material*.—Of this species I have examined a single badly preserved male from Bogota (Keyserling's Collection).

*Variation*.—Besides the specimen mentioned I have examined another male from New Granada (Keyserling's Collection), which in some respects varied rather considerably. The *galea* is longer and more slender. The maxillæ slightly granular in the middle. The proportions between the joints of the palps somewhat different, as *femur* is 4.2 as long as wide, tibia 3.3 and hand 1.2 as long as finger; the immovable finger bears anteriorly at least two "spots" in the middle, and the movable finger three spots near to the ventral margin. The legs are more slender, as the *tarsus* of the first pair of legs is at least as long as the tibia, and the femur of the fourth pair is 2.8 as long as deep and 2 as low as tarsus. I give for comparison the measurements of the palps: trochanter 0.368 (0.230); femur 0.966 (0.230); tibia 0.828 (0.253); hand 0.690 (0.368); finger 0.575.

*Remarks*.—Taking into consideration the scanty material examined, I do not consider the above-mentioned differences sufficiently important to establish two species.

From *Chelifer proximus* Ell. (*cf.* 19. pp. 324–326) this species differs only in colour and the length of the finger, which is shorter, not much longer than the hand. From *Ch. rufus* Balz. it differs in the structure of the sternal areas, in the less distinctly granular maxillæ, and in the less slender palps (especially femur and finger); from *Ch. canestrinii* Balz. in the structure of the sternal areas and the shorter hand.

#### 7. CHELIFER CANESTRINII Balz. (Plate XXIX. figs. 5 a–d.)

1890. Balzan, (10) pp. 430–431, tav. xv. figs. 14–14 c.

1891. Balzan, (11) p. 532, pl. xi. figs. 22–22 a.

1905. Ellingsen, (18) pp. 16–17.

1905. Ellingsen, (19) p. 324.

*Cephalothorax*.—Distinct *eyes*. Cephalothorax distinctly longer than wide, with very broad and almost straight transverse grooves. Distinctly granular all over, with short clavate hairs.

*Abdomen* (Pl. XXIX. fig. 5 a).—All tergites with more or less distinct longitudinal line and distinctly granular; the short clavate hairs, in number from 10–14, are placed along the hindmost margin, and the median and hindmost segments possess in addition to these generally six hairs in front of the row. All the *sternites* from the fourth to the tenth are longitudinally divided, and are smooth or almost so in the middle, but laterally are slightly granular. In the seventh and eighth segments the longitudinal line is widened out behind, and in the wide pale area so formed are situated in the seventh segment two circular bodies, and in the eighth segment one (fig. 5 a).

Each of these bodies is composed of very small rings, placed close together, the two small ones on the seventh sternite consisting of 20 each, and the single bigger one on the eighth sternite composed of 50. No spines were observed placed within these rings as in other species of this group, but nevertheless in all probability they are present.

*Antennæ*.—The terminal hair extends in a slight degree beyond the *galea*, which has five short distal teeth.

*Palps* (Pl. XXIX. figs. 5 *b-c*).—The *maxillæ* are smooth in the middle, but laterally slightly granular; the palps are distinctly granular, with the exception of the fingers and part of the hand below. The rather short hairs are moderately clavate on the trochanter and femur, slightly so on the tibia, and only obtuse on the hand. The *trochanter*, which has a short, well-defined stalk, is 1.8 as long as wide; the anterior surface is distinctly convex, while the posterior surface is only slightly convex below, but above is fairly distinctly produced. *Femur* has a short, not well-limited stalk, beyond which it is of almost equal width throughout. It is scarcely 3.7 as long as wide; anteriorly it is almost straight; posteriorly slightly convex basally and terminally, but straight between. The *tibia*, which is little, but yet distinctly, wider than the femur, has a fairly short and well-defined stalk and is scarcely three times as long as broad; the anterior outline beyond the stalk is very slightly convex, while the posterior beyond the small condylus and fairly well-marked basal elevation is straight and then slightly convex. The *chela* is about 3.9 as long as wide; the *hand*, which is distinctly narrower than the trochanter is long, is only a little shorter than, but 1.3 as broad as, tibia; it is distinctly twice as long as wide, somewhat wider than deep, and about 1.1 as long as fingers, which do not gape when closed. The immovable finger has anteriorly only a single “spot,” placed between the basal and the median tactile hairs, but posteriorly three spots (fig. 5 *c*); the movable finger only bears three spots, placed close together posteriorly.

*Coxæ* (Pl. XXIX. fig. 5 *d*).—The first two pairs are not in any marked degree different from those of *Ch. rufus* Balz. (*cf.* text-fig. 64), but the third is less distinctly triangular, as the inner margin is rounded and not pointed; the fourth pair differ distinctly in possessing a markedly less concave posterior margin.

*Legs*.—Proximal joints at least with scale-shaped granules. The hairs of the dorsal side of the femur, the tibia, and basally even the tarsus of the fourth pair of legs are more or less distinctly clavate, while the corresponding hairs of the first pair are obtuse and dentated; hairs of ventral side pointed and more or less simple; the trochanters as well as the trochantins possess ventrally a very long and slender hair. A tarsal “tactile” hair, scarcely one-fourth removed from the end and almost twice as long as this distance, is present. The *trochantin* of the first pair of legs is somewhat wider than the femur proper, and the articulation is like that previously described (*cf.* above); the *tarsus* is a little longer than the tibia and 4.2 as long as deep. The



*femur* of the fourth pair of legs is 2·7 as long as deep, almost 1·3 as long as tibia, and 2 as low as tarsus long; the latter is only a trifle shorter than the tibia. Legs as a whole of less slender appearance than those of *Ch. rufus* Balz. (*cf.* figs. 3 *c-e*).

*Colour*.—Palps and cephalothorax reddish brown with darker transverse grooves, and abdominal tergites paler brown.

*Measurements*.—Cephalothorax 0·620 (0·575); abdomen 1·265 (0·805) mm.

Palps: trochanter 0·285 (0·161); femur 0·598 (0·175); tibia 0·560 (0·195); hand 0·506 (0·240), depth 0·225; finger 0·460 mm.

Leg I.: femur 0·395 (0·137), trochantin 0·110 (0·152); tibia 0·251 (0·084); tarsus 0·258 (0·061) mm.

Leg IV.: femur 0·441 (0·162); tibia 0·334 (0·107); tarsus 0·327 (0·068) mm.

*Material*.—I have examined two males, viz., one of Mr. Ellingsen's original specimens and one collected by Dr. F. Meinert at La Moka in the month of August. The species has also been recorded from Paraguay, Venezuela, Brazil, and Ecuador.

*Variation*.—A smaller and paler specimen in the British Museum showed a few features worth recording. The seventh sternite possessed only a single circular area, somewhat smaller than that of the following segment, instead of two. The immovable finger had posteriorly four spots instead of three, and the movable two instead of three. As no other differences were observed, this animal is most naturally referred to *Ch. canestrinii* Balz. The label mounted with the specimen reads "Balthazar (Windward), Island of Grenada, 250 feet, Aug. 8. Open place under piles of rotting weeds."

*Remarks*.—This species is easily distinguished from the two preceding as well as from *Ch. proximus* Ell. by the less slender femur and the longer hand; from the latter species also by the much shorter fingers. The male is easily distinguished from all species examined by me by the structure of the sternal areas.

#### 8. CHELIFER LONGICHELIFER Balz. (Plate XXIX. figs. 6 *a-d*.)

1890. Balzan, (10) pp. 433–434, tav. xv. fig. 16 (♂ ♀) –16 *c*.

1891. Balzan, (11) p. 534, pl. xi. figs. 26, ♂ ♀.

1905. Ellingsen, (19) p. 324.

1907. Tullgren, (23) p. 35.

#### *Male.*

*Cephalothorax*.—Two rather indistinct *eyes*, or, perhaps more correctly, ocular spots only. Cephalothorax is distinctly longer than wide, almost as wide in the anterior third as behind, but beyond distinctly attenuated. The two transverse *grooves* are generally rather indistinct; the anterior is almost straight in the middle, but the posterior is slightly curved forwards. Distinct and rather pointed granules are found everywhere except on the white spot, which covers the median portion of the second tergite; short, distinctly clavate hairs are found in numbers.

*Abdomen* (Pl. XXIX. fig. 6 *a*).—Rather depressed abdomen, not very much longer than wide. All the tergites, except the eleventh and perhaps the first, are longitudinally divided. The sclerites are distinctly *granular*, with scale-shaped granules on all the dark-coloured portions, with the exception of the whole first tergite and a very wide longitudinal band, which decreases towards the tip of the abdomen, in correspondence to the gradual development of granulations along the anterior margin; the eighth and ninth tergites, for instance, are almost entirely granular, while the two following are completely so. The tergites possess along the hindmost margin a row of from 10–12 moderately long and clavate hairs, in addition to 6 in front of the row on the V.–X. segments; the eleventh tergite has at least one pair of long slender “tactile” hairs.

The *genital area* appears almost completely similar to that of *Ch. rufus* Balz. (*cf.* text-fig. 64). The sternites are almost smooth in the middle, but slightly granular laterally; the eleventh bears two pairs of “tactile” hairs; the IV.–X. sternites are longitudinally divided. This longitudinal line is in the VII.–IX. sternites widened out, so that an almost circular pale area is established (Pl. XXIX. fig. 6 *a*); within each of these areas spines are placed rather apart from each other in a varying number (from about 15–25), which is always greatest in the eighth sternite and smallest in the seventh.

*Antennæ*.—The terminal hair extends in a small degree beyond the short *galea*, with a few short teeth (*cf.* 10. fig. 16 *b*, ♂).

*Palps* (Pl. XXIX. figs. 6 *b–c*).—The *maxillæ* are almost smooth in the middle, distinctly granular laterally; the trochanter is distinctly granular above, while the other joints are almost or completely smooth. The short *hairs* of the trochanter, and the femur partly, are moderately clavate, while those of tibia and hand are slightly clavate or obtuse. The palps are exceedingly long and slender, much longer than the body. The *trochanter*, which has a fairly long and well-defined stalk, is almost 2·3 as long as wide; the anterior surface is very slightly convex, while the posterior is almost straight, ventrally and dorsally produced into a low rounded protuberance. The *femur* has a short, not well-limited stalk, beyond which it is gradually, but in a very high degree, widened out towards the end. It is 6·3 as long as wide; anteriorly beyond a short and low basal elevation it is almost straight, and so it is posteriorly, but for a slightly marked convexity terminally. The *tibia*, which is as long, but scarcely as wide, as the femur, has a rather short well-defined stalk and is 6·4 as long as wide; the anterior surface beyond the stalk is slightly convex, while the posterior beyond the well-marked basal elevation is moderately concave; the whole joint is very much widened out towards the extremity. The *chela* is 4·7 as long as wide; the *hand*, which is 1·7 narrower than the trochanter is long, is 1·5 as short as and 1·6 wider than the tibia; it is 2·8 as long as wide, somewhat wider than deep, and 1·5 as long as the fingers, which gape a trifle when closed; the lateral



outlines are slightly convex, with the greatest curvature towards the middle. The *immovable* finger has a single "spot" anteriorly just beneath the median tactile hair, while posteriorly it has five spots arranged as shown in fig. 6c; the movable finger has three spots only, arranged somewhat behind and a little in front of the median tactile hair.

*Coxæ*.—The coxæ resemble in structure those of *Ch. rufus* Balz., but the second pair have the interior margin much shorter and consequently appear more triangular, while the third pair are scarcely different, the interior margin being a mere point; the fourth pair have a more triangular appearance than in *Ch. rufus* Balz., as the inner margin is very short and the hinder almost straight.

*Legs*.—Proximal joints are very indistinctly granular. The rather short hairs are dorsally slightly clavate or obtuse, except on the tarsus terminally; ventrally they are obtuse or pointed, simple or almost simple; the trochanter and trochantin possess one long slender hair on the ventral surface; the tarsal "tactile" hair is two-thirds removed from the base and much longer than this distance to the end. For the structure of the femur of the first pair of legs I refer to *Ch. rufus* Balz.; the tibia is 1.2 as long as the *tarsus*, which is 4.9 as long as deep. The *femur* of the fourth pair of legs is 2.6 as long as deep, almost 1.2 shorter than tibia and 1.6 lower than the tarsus is long.

*Colour*.—The colour is very characteristic. The palps are yellowish brown with dark brown chela; the cephalothorax is dark brown, sometimes almost blackish, with a white spot, which almost covers the median portion of the second tergite. The lateral parts as well as the tip of the abdomen are greenish brown, while the middle is adorned with a white band in continuation of the thoracic one, almost completely covering the first abdominal tergite and decreasing in width towards the end.

*Measurements*.—Cephalothorax 0.828 (0.598); abdomen 1.051 (0.736) mm.

Palps: trochanter 0.437 (0.195); femur 1.081 (0.175); tibia 1.081 (0.169); hand 0.713 (0.253), depth 0.230; finger 0.483 mm.

Leg I.: femur 0.456 (0.152), trochantin 0.099 (0.160); tibia 0.342 (0.099); tarsus 0.281 (0.053) mm.

Leg IV.: femur 0.562 (0.220); tibia 0.471 (0.110); tarsus 0.357 (0.065) mm.

#### *Female.*

*Abdomen*.—The granulation is more uniformly distributed all over, as the white longitudinal band is less developed.

*Antennæ*.—The *galea* is very nearly the same as in the male, but extends distinctly beyond the terminal hair.

*Palps* (Pl. XXIX. fig. 6d).—Not only trochanter, but also interior surfaces of the tibia and femur fairly distinctly granular. The *trochanter*, which is 1.9 as long as

wide, has the anterior outline more distinctly convex. The *femur*, which is about 3·8 as long as wide, is less distinctly widened out towards the extremity. The *tibia*, which is somewhat shorter and broader than the femur, has a short and fairly well-defined stalk and is 3·2 as long as wide; anteriorly it is very slightly convex, and posteriorly beyond the short basal elevation almost straight. The *chela* is 3·1 as long as wide; the hand, which is as wide as the trochanter is long, is scarcely 1·1 shorter than the tibia, but 1·6 broader; it is 1·8 as long as wide, as wide as deep, and 1·3 as long as fingers, which scarcely gape when closed; lateral outlines moderately convex, with most raised part just beyond the stalk. The number of "spots" anteriorly is as in the male, but posteriorly slightly differs, as seen in fig. 6 d.

*Coxæ*.—The second and the third pair are less distinctly triangular, as the interior margins are longer; the fourth pair are quite dissimilar and distinctly quadrangular, as the interior margin is well developed, scarcely shorter than the exterior and only 1·5 shorter than the posterior.

*Legs*.—The granulation is better marked; the proportions between the joints differ in a slight degree, as the tibia of the first pair is scarcely 1·1 as long as the *tarsus*, which is about 4·7 as long as deep, and *femur IV.* is only 2·4 as long as deep.

*Colour*.—The colour is sometimes fairly similar to that of the male, but with white spots on the second thoracic tergite and white band on the abdomen less prominent; in other cases scarcely any difference whatever.

*Measurements*.—Cephalothorax 0·621 (0·552); abdomen 1·38 (0·805) mm.

Palps: trochanter 0·299 (0·161); femur 0·690 (0·184); tibia 0·621 (0·195); hand 0·575 (0·322), depth 0·322; finger 0·437 mm.

Leg I.: femur 0·403 (0·127); trochanter 0·091 (0·132); tibia 0·296 (0·079); tarsus 0·281 (0·060) mm.

Leg IV.: femur 0·501 (0·205); tibia 0·410 (0·110); tarsus 0·342 (0·068) mm.

*Material &c.*—Of this species I have examined a number of specimens, viz., 3 females collected by Dr. W. Sörensen at Riacho dell' Oro, and 12 males and 3 females collected by Dr. Fr. Meinert in Venezuela, for instance, at Caracas under bark of *Bombax* in the month of June, in rotten branches with termites, Los Trinchéras, in the month of November, La Moka, by sifting in August, and San Estéban. Previously it had been recorded from Paraguay, Brazil, Venezuela, and Ecuador.

*Remarks*.—It is not without hesitation that the species described is referred to *Ch. longichelifer* Balz., for Balzan writes in his description "Il trocantere è eguale nei due sessi, molto più lungo che largo," while the difference in the length of the trochanter is very marked in the two sexes; but as Balzan's own figures (11. figs. 26, ♂ ♀) show some difference, I think that Balzan's original specimens must be examined before settling the question definitively. Other variations found in



the proportions of joints of the palps—for instance, tibia a little wider than femur—are probably of small importance. That Balzan has not mentioned the very characteristic colour in the male may perhaps be explained by the bad preservation or the age of his few specimens. On full consideration it would be premature to establish a new species. The species is easily distinguished in both sexes by the slender femur and short fingers.

9. CHELIFER SEGMENTIDENTATUS Balz. (Plate XXIX. figs. 7 *a-j*; text-fig. 65.)

1890. Balzan, (10) pp. 428–430, tav. xiv. figs. 13 (♂ ♀)–13 *b*.

1891. Balzan, (11) p. 548.

1905. Ellingsen, (19) pp. 12–13.

*Male.*

*Cephalothorax*.—Indistinct *ocular* spots present. The cephalothorax is much longer than broad behind, where it is broadest. The *transverse grooves* are very deep and prominent; they are almost straight in the middle, but laterally the anterior is directed forwards and the posterior backwards. Skin coarsely granular everywhere, and provided with short distinctly clavate hairs. The second tergite is gradually raised towards its posterior serrated margin.

*Abdomen* (Pl. XXIX. fig. 7 *a*).—The abdomen is of a slender appearance, being at least twice as long as broad; sclerites increase in length as well as in breadth towards the sixth one, and then decrease towards the end. All the tergites divided by a longitudinal line, which is almost obsolete on the first two at least. The first five tergites show traces of lateral keels and the *first eight* have the posterior margin of the sclerites irregularly undulated and serrated. The sclerites are distinctly granular all over, and bear a row of short fairly distinctly clavate hairs numbering from 10–12 along the posterior margin of the median segments, in addition to 6 in front of the row; the XI. tergite possesses probably a pair of “tactile” hairs.

Sternites without longitudinal line. The posterior portion of the VI.–VII. sclerites is rather pale and is provided with a few short spines, while the two following sternites show an area with a convex anterior margin, as long as  $\frac{2}{3}$  and as wide as  $\frac{1}{3}$  of the whole sclerite, which is beset with a large number (c. 80) of rather long spines standing close together.

*Antennæ*.—The terminal hair scarcely extends beyond the *galea*, which is suddenly attenuated and provided with a few almost obsolete teeth (*cf.* Balzan, fig. 13 *b*, ♂).

*Palps* (Pl. XXIX. figs. 7 *b-e*).—The *maxillæ* are smooth in the middle, but laterally and in front slightly granular; the palps are fairly distinctly granular above, with the exception of the almost smooth hand; on the under surface only the proximal joints are slightly granular; the hand, like the fingers, is completely smooth. The trochanter and the femur are provided with a number of rather long or distinctly clavate *hairs*, placed along the concave basal portion of the anterior surface of the latter joint; the hairs of the tibia as well as the hand are slightly

clavate or even obtuse. The *trochanter*, which has a rather short and distinct stalk, is 1.6 as long as wide; the anterior surface is moderately but somewhat irregularly convex, while the posterior has the ventral margin slightly produced, and dorsally distinctly so into a low conical protuberance, so that the trochanter appears bigibbose. The *femur* has a short fairly well-limited stalk, beyond which it is only slightly widened out towards the end. It is four times as long as wide; anteriorly beyond a low basal elevation it is first moderately concave and then almost straight, while posteriorly it is slightly convex basally and terminally, but almost straight between. The *tibia*, which is as long as, but distinctly wider than, the femur, has a long well-defined stalk, and is 2.6 as long as wide. The anterior outline is moderately convex, while the posterior beyond the only slightly pronounced basal elevation is first straight and then slightly convex. The *chela* is 2.8 as long as wide; the *hand*, which is distinctly wider than the trochanter is long, is almost 1.2 as short as and 1.5 as wide as the tibia; it is 1.4 as long as broad, as wide as deep, and scarcely 1.1 shorter than the fingers, which gape considerably when closed: the outlines of the hand are strongly convex. The *immovable* finger bears marginal teeth in the distal half, while the movable has only blunt teeth terminally; anteriorly the immovable finger has a single "spot" beneath the median hair, and posteriorly three spots (*cf.* figs. 7 *d-e*), while the movable finger has two spots anteriorly, but three posteriorly.

*Coxæ* (Pl. XXIX. fig. 7 *f*).—The second pair, and still more markedly the third pair, have short interior margins and consequently appear triangular; in the fourth pair the rather short interior margin gradually merges into the concave posterior one; it is distinctly enlarged towards the extremity, appears triangular, and has the postero-exterior corner produced backwards as a short point.

*Legs* (Pl. XXIX. figs. 7 *g-i*).—The proximal joints are granular; dorsally the legs bear rather short hairs, which are distinctly clavate in the fourth pair of legs, but only moderately or slightly so in the first pair; ventrally they are pointed, and more or less simple, in the fourth pair of legs as well as terminally in the first pair; trochanters and trochantins with usual "tactile" hairs; a tarsal "tactile" hair,  $\frac{2}{3}$  removed from the base, perhaps present. The trochantin, which is less deep than the femur proper, is articulated to it in the usual way (fig. 7 *h*, *cf.* *Ch. rufus* Balz.); the tibia is scarcely 1.1 as long as the *tarsus*, which is about 4.5 as long as deep. The *femur* of the fourth pair of legs, which is very abruptly raised beyond the stalk and somewhat attenuated towards the end, is almost twice as long as deep, 1.2 as long as tibia, and 1.2 lower than tarsus long. The legs are, as a whole, exceedingly short and clumsy.

*Colour*.—Palps yellowish brown with darker fingers; body dorsally darker brown.

*Measurements*.—Cephalothorax 0.647 (0.460); abdomen 1.449 (0.647) mm.

Palps: trochanter 0.253 (0.161); femur 0.506 (0.125); tibia 0.506 (0.195); hand 0.414 (0.299), depth 0.299; finger 0.437 mm.



Leg I.: femur 0.334 (0.137), trochantin 0.076 (0.129); tibia 0.258 (0.084); tarsus 0.243 (0.053) mm.

Leg IV.: femur 0.426 (0.217); tibia 0.365 (0.106); tarsus 0.274 (0.068) mm.

*Variation.*—Another, probably a young male, was distinctly smaller, had the posterior margin of the abdominal tergites more regularly serrated; the hand comparatively narrower, and the space left between the fingers when closed much smaller; fingers comparatively shorter.

#### *Female.*

*Cephalothorax.*—The transverse *grooves* are less prominent and the anterior appears more curved backwards, as it is laterally directed forwards.

*Abdomen.*—The abdomen appears less slender, as it is scarcely twice as long as broad. The tergites show no trace of serrated posterior margin; the longitudinal line is not visible in the first three and the last tergites, and is only slightly pronounced in those between. The tergites are not very distinctly granular and have a greater number of hairs along the hindmost margin, viz., about 14; the eleventh tergite has a pair of long slender "tactile" hairs.

*Antennæ.*—The exceedingly long, slender, cylindrical *galea*, which has about six short terminal branches, extends very much beyond the terminal hair (*cf.* 10. fig. 13 *b*, ♀).

*Palps.*—The hairs are perhaps somewhat shorter than in the male. Anteriorly the *trochanter* is slightly and regularly convex, posteriorly less distinctly bigibbose than in the male. The *femur*, which is more distinctly widened out towards the end, is 3.2 as long as broad; anteriorly beyond the stalk it is almost completely straight. The *tibia* is shorter than the femur and 2.4 as long as wide. The *hand*, which is only a little shorter than, but 1.4 as long as the tibia, is 1.6 as long as broad, a little wider than deep, and 1.2 as long as fingers, which scarcely gape when closed; "spots" anteriorly are arranged almost as in the male.

*Coxæ* (Pl. XXIX. fig. 7*j*).—The fourth pair of coxæ are of a more quadrangular appearance, as they are only in a slight degree widened out towards the end, and the interior margin is fairly long and well defined from the concave hinder one; the postero-exterior corner is scarcely produced.

*Legs* (text-fig. 65).—The femur of the fourth pair of legs is less abruptly raised beyond the stalk, is more slender, viz., 2.2 as long as deep, 1.1 as long as tibia, and 1.5 lower than tarsus long.

*Colour.*—Colour of the cephalothorax, but especially of the yellowish abdomen, much lighter.

*Measurements.*—Cephalothorax 0.575 (0.414); abdomen 1.104 (0.667) mm.

*Palps:* trochanter 0.253 (0.161); femur 0.506 (0.150); tibia 0.460 (0.190); hand 0.437 (0.276), depth 0.253; finger 0.368 mm.

Text-fig. 65.



*Ch. segmentidentatus* Balz., ♀.  
Femur of left leg IV. in anterior view.  $\times 57$ .

Leg I.: femur 0.312 (0.122), trochantin 0.083 (0.122); tibia 0.236 (0.079); tarsus 0.182 (0.049) mm.

Leg IV.: femur 0.418 (0.187); tibia 0.365 (0.106); tarsus 0.289 (0.061) mm.

*Material &c.*—Of this species I have examined two males and a single female, collected by Dr. Fr. Meinert by sifting at La Moka, in the month of August. This species has been previously mentioned from Paraguay and Brazil.

*Remarks.*—In minor details, not worth enumerating, my specimens differ from Balzan's description, and also in the very long fingers of the palps in the male, a character not mentioned by Balzan; as the description of the last-mentioned author is not very complete, I do not find any reason to establish a new species. My specimen (female) differs from Ellingsen's description "in the presence of long hairs on the posterior somites" (*cf.* 19. p. 12), in the femur, which is of almost equal breadth throughout, and in the hand, which is only a little wider than the tibia and longer than the finger (*cf.* 19. p. 13).

The male is easily distinguished from all other species of this group by the peculiar structure of the abdominal tergites. The female is distinguished from *Ch. longichelifer* Balz. by the less slender femur of the palps as well as by the more elongated shape of the other joints, but especially by the rather long, distinctly clavate hairs.

10. CHELIFER SATANAS, sp. n. (Plate XXIX. figs. 8 a-c; text-fig. 66.)

*Cephalothorax.*—Rather indistinct *ocular* spots present. The cephalothorax is much longer than wide behind and gradually attenuated towards the front. The *transverse grooves* are very deep and prominent; the deeper posterior one is almost straight, while the anterior is laterally bent outwards and directed forwards. Skin distinctly and coarsely granular everywhere and provided with short distinctly clavate hairs. The second tergite is gradually raised towards its posterior serrated margin.

*Abdomen.*—The abdomen is short and clumsy, almost obovate in shape, far from twice as long as broad; the sclerites increase in length as well as in breadth towards the sixth one. All the tergites are divided by a longitudinal line, which is rather indistinct in the first ones, but becomes more and more prominent behind. The first seven tergites show traces of lateral keels and the first eight have the posterior margin irregularly undulated and serrated. The sclerites are markedly granular all over and bear rather short clavate hairs along the posterior margin in number from 10–12; the V.–X. tergites possess in addition to these, six hairs in front of the row, placed within prominent white spots; the XI. tergite has a pair of very long slender "tactile" hairs.

*Sternites* without longitudinal line; the VI.–IX. sternites have a greater or lesser part of the sclerites pale; this pale area has the anterior margin convex, and possesses in the first-mentioned sternite only a few spines, but in the last two a large number (about 80) of rather long spines standing close together. The last sternite bears two pairs of "tactile" hairs, and the last but one a single pair only.



*Antennæ*.—The terminal hair extends perhaps in a slight degree beyond the acute *galea*, which possesses a few obsolete terminal teeth.

*Palps* (Pl. XXIX. figs. 8 *a-b*).—The maxillæ are granular laterally and in front, but behind are almost smooth in the middle; the palps are distinctly granular above with the exception of the hand; underneath the granulation is less developed and even wanting in the hand, which has its lower surface, like the fingers, smooth all over. All the joints except the fingers are provided with short or very short, more or less distinctly clavate hairs. The *trochanter*, which has a fairly long and well-defined stalk, is 1.9 as long as wide; the anterior surface is moderately and regularly convex, while the posterior has the ventral margin just beyond the stalk produced into a fairly long and rounded conical eminence (fig. 8 *b*), but dorsally it is only slightly produced. The *femur*, which has a fairly short, well-limited stalk, is scarcely widened out towards the end and is broadest in the middle. It is about 3.5 as long as wide; anteriorly beyond the stalk as well as distally it is slightly concave, but a trifle convex or even obtuse-angled between, while posteriorly it is slightly convex basally and then almost straight but for a slightly marked terminal convexity. The *tibia*, which is distinctly shorter and wider than the femur, has a long well-defined stalk and is almost 2.5 as long as wide; anterior outline is distinctly produced in the middle, with the margin almost straight behind the protuberance thus formed, but slightly concave beyond, while the posterior outline beyond the slightly pronounced basal elevation is first straight and then moderately convex. The *chela* is three times as long as wide; the *hand*, which is distinctly narrower than the length of the trochanter, is 1.1 shorter and 1.5 wider than the tibia, it is 1.5 as long as wide, distinctly wider than deep, and scarcely as long as the fingers, which gape moderately when closed; the lateral outlines of the hand are distinctly convex. Both fingers have teeth on the margin from near the base to the tip, those of the immovable finger being the better developed; the immovable finger has anteriorly a single "spot" behind the median tactile hair, and the movable one has either a single spot or two apart from each other in the middle.

*Coxæ* (Pl. XXIX. fig. 8 *c*).—The second and the third pair are scarcely different from the corresponding pairs of the preceding species (*cf.* p. 243); the fourth pair are less slender, have the interior margin longer and better marked, and are almost straight behind, with the postero-exterior corner only slightly produced.

*Legs* (text-fig. 66).—The proximal joints are granular. The hairs of the dorsal surface of the fourth pair of legs are exceedingly short, at least on the basal joints, and more or less strongly clavate; those of the first pair are somewhat longer and less distinctly clavate; the hairs of the ventral side are generally pointed and more or less simple; the trochanter and trochantins with the usual "tactile" hairs. The tarsal

Text-fig. 66.



*Ch. satanas*, sp. n.,  
♂. Femur of left  
leg IV. in anterior  
view.  $\times 57$ .

"*tactile*" hair is about  $\frac{2}{3}$  removed from the base. The trochantin and the femur proper of the first pair of legs are of almost equal depth and the articulation between them is of the usual structure (*cf.* figs. 7 *g-h*); the tibia is scarcely 1.1 as long as the *tarsus*, which is 4.2 longer than deep; the *femur* of the fourth pair of legs, which is very abruptly raised beyond the stalk and slightly attenuated towards the end, is 2.2 as long as deep, 1.2 as long as tibia, and 1.3 lower than tarsus long. When the animal is observed from above, the legs are easily seen to be thicker and more powerful than in the preceding species.

*Colour*.—Palps yellowish brown with darker chelæ; cephalothorax, and more especially the abdomen, darker brown.

*Measurements*.—Cephalothorax 0.782 (0.529); abdomen 1.035 (0.690) mm.

Palps: trochanter 0.322 (0.175); femur 0.598 (0.175); tibia 0.506 (0.215); hand 0.437 (0.285), depth 0.253; finger 0.450 mm.

Leg I.: femur 0.364 (0.152), trochantin 0.076 (0.152); tibia 0.289 (0.099); tarsus 0.274 (0.065) mm.

Leg IV.: femur 0.517 (0.236); tibia 0.418 (0.129); tarsus 0.304 (0.071) mm.

*Material*.—Of this curious diabolical-looking little species Dr. Fr. Meinert collected a single male at Los Trinchéras in the month of December.

*Remarks*.—This species is nearly related to *Ch. segmentidentatus* Balz., but is easily distinguished by the structure of the trochanteral part.

# 11. CHELIFER INSIGNIS, sp. n. (Plate XXIX. figs. 9 *a-e*.)

## *Female.*

*Cephalothorax*.—Two prominent real *eyes* are present. Cephalothorax is distinctly longer than wide, and provided with two almost straight transverse grooves, of which the anterior is the more prominent. Skin distinctly granular everywhere, with a number of short clavate hairs.

*Abdomen*.—Abdomen, which in the specimen examined is dilated with eggs, is twice as long as broad and of a fairly slender appearance. All the tergites, with the exception of the eleventh, are longitudinally divided by a rather indistinct line, similarly to the second tergite. Sclerites provided with scale-shaped granules. The hairs, which are slightly clavate, increase in length towards the end of the abdomen from short to fairly long; their number and arrangement are very curious. The first two tergites, which are rather short, possess only a transverse row along the hindmost margin consisting of about 14 hairs. The following segments have generally in the hindmost row from 10 to 14 hairs, the greatest number being in the median tergites, in addition to 2 lateral hairs and 6 median, placed within pale spots, in front of the row; exceptions which may be mentioned are that the third tergite has no median hair in front of the row and that the ninth and tenth tergites have on each side two hairs in



front of the row laterally, the posterior of these two hairs corresponding to the exterior in the hindmost transverse row of the preceding segments, which has changed its position in correlation with the different shape of the sclerites. Of course the position of the above-mentioned hairs is not always the same on the right and on the left side, and it is not always easy to tell to which category a hair is to be referred. The eleventh tergite bears probably a pair of "tactile" hairs.

*Antennæ*.—The very long and slender cylindrical *galea*, which has about six short terminal branches, is almost twice as long as the terminal hair.

*Palps* (Pl. XXIX. figs. 9 a-c).—The *maxillæ* are almost smooth in the middle, but granular laterally and in front; the palps are distinctly granular, especially above, with the exception of the fingers, which are smooth, and the hand, which is indistinctly granular above and almost smooth beneath. The hairs are short; those of the trochanter and femur are slightly clavate, while most of those on the tibia and hand are obtuse. The *trochanter*, which has a rather short and well-defined stalk, is about 1.5 as long as wide; the anterior outline is moderately convex, while the posterior surface is ventrally slightly produced just beyond the stalk but dorsally produced into a rather deep, rounded, conical protuberance. The *femur*, which has a short fairly well-defined stalk beyond the middle, where it is widest, is somewhat attenuated towards the end, and is 2.6 as long as wide; anteriorly beyond the stalk it is almost straight, while posteriorly beyond the stalk it is first rather abruptly convex and then very slightly so. The *tibia*, which is of almost equal length to, and somewhat wider than, the femur, has a short and fairly well-defined stalk and is 2.2 as long as wide; the anterior outline beyond the stalk is moderately convex, while the posterior beyond the slightly marked condylus and almost obsolete basal elevation is first straight and then terminally slightly convex. The *chela* is almost three times as long as wide; the hand, which is a little broader than the trochanter is long, is 1.1 shorter but 1.3 wider than the tibia; it is 1.6 as long as wide, somewhat wider than deep, and 1.3 as long as the fingers; the lateral outlines of the hand are only moderately convex. The fingers possess "spots" anteriorly as well as posteriorly, the number and arrangement of which have been figured (figs. 9 b-c).

*Coxæ*.—The fourth pair, which are somewhat widened out towards the end, have the interior margin, which is half as long as the posterior, fairly well defined from the latter, which is almost straight.

*Legs*.—The proximal joints are very indistinctly granular; dorsally the hairs are short and slightly clavate or obtuse, while ventrally they are pointed and more or less simple; the trochanters and trochantins have the usual "tactile" hairs on the ventral surface. A tarsal "tactile" hair seems to be present,  $\frac{2}{3}$  removed from the base. The *trochantin* of the first pair of legs is only a little deeper than the femur proper and the articulation is of the usual structure (cf. above); the tibia is only a trifle shorter than the *tarsus*, which is 4.5 as long as deep. The *femur* of the fourth pair of legs, which

is gradually raised beyond the stalk, is 2.5 as long as wide, 1.1 as long as tibia, and 1.6 lower than tarsus is long. The legs are, as a whole, moderately long and slender.

*Colour*.—Cephalothorax and palps different shades of reddish brown; the tergal sclerites light brown.

*Measurements*.—Cephalothorax 0.736 (0.667); abdomen 3.00 (1.518) mm.

Palps: trochanter 0.345 (0.240); femur 0.655 (0.253); tibia 0.667 (0.299); hand 0.598 (0.365), depth 0.345; finger 0.460 mm.

Leg I.: femur 0.441 (0.152), trochantin 0.114 (0.160); tibia 0.327 (0.099); tarsus 0.312 (0.067) mm.

Leg IV.: femur 0.570 (0.228); tibia 0.505 (0.122); tarsus 0.372 (0.079) mm.

*Variation*.—This species is probably identical with a much smaller mutilated female collected by Reinhardt in Lagoa Santa (Brazil), the main differences being size, smaller number of "spots" on the fingers, and longer and more slender legs, having the femur IV. 2.7 instead of 2.5 as long as deep and 1.8 for 1.6 lower than tarsus. The number of "spots" anteriorly is 2 in the immovable and none in the movable finger, and posteriorly 3 and 1 respectively (*cf.* figs. 9 *d-e*).

*Material*.—A single female from Contiroguita collected by Mr. Hygom.

*Remarks*.—I was at first inclined to refer this species to *Ch. exilimanus* Balz. (10. pp. 426–427, tav. xiv. figs. 11–11 *b*), the description of which is not very exhaustive, but, on fuller consideration, I think the differences too important to be explained. *Ch. exilimanus* Balz. differs from the above-described species in the smaller number of hairs in front of the row on the abdominal tergites, in the femur of the palps, which is provided with a prominent basal "apophysis" anteriorly, and in the hand, which is only 1.1 broader than tibia and about 1.7 as long as finger.

This species, of which I am sorry not to have had any male at my disposal, is, on account of the structure of the articulation between the trochantin and the distal femoral part of the first pair of legs, naturally referred to the *Ch. subruber* Sim. group. From the other species it may easily be distinguished by the large number of hairs in front of the row on the abdominal tergites, by the comparatively robust femur, and by the narrow hand, which is distinctly longer than the finger.

## 12. CHELIFER EXILIMANUS Balz.

1890. Balzan, (10) pp. 426–427, tav. xiv. figs. 11–11 *b*.

1891. Balzan, (11) p. 549.

The abdominal tergites have not more than six slightly clavate hairs in front of the row. The *femur*, which has a basal apophysis anteriorly, is 2.7 as long as wide; the *tibia* is 2.5 as long as wide and as long as the *hand*, which is only 1.1 as wide as this joint and 1.7 as long as the finger.—Paraguay.

On account of the structure of the flagellum and galea I refer this species without hesitation to the *Ch. subruber* Sim. group.

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## III. Group of CHELIFER CIMICOIDES F.

*Femur of the first pair of legs with wide oblique articular cavity, with posterior condylus placed near ventral margin. Fingers of the palps with accessory teeth. Indistinct eyes or ocular spots. Tarsal "tactile" hair at least  $\frac{1}{2}$  removed from base.*

This group, as is easily realised when the above meagre diagnosis is compared with those of the preceding groups, is not so well defined as the three others, and I am not quite sure that all the species referred to it really go naturally together; but, as several species could not be examined, and as I had no opportunity of examining and comparing the male genital organs, I have accepted the above definition, as at least one structure, viz. that of the accessory teeth on the fingers of the palps, is characteristic of all the members of this group. The genital apparatus of the male viewed from the outside shows a marked difference when, for instance, *Ch. bicolor* Balz. and *Ch. argentinus* Thor. are compared; but only a closer investigation will show whether these organs are fundamentally different. I have subdivided this group into four subgroups, namely, the *Ch. rudis* Balz. s.-g., *Ch. subrobustus* Balz. s.-g., *Ch. bicolor* Balz. s.-g., and *Ch. argentinus* Thor. s.-g. The last-mentioned of these four divisions is quite a natural one and easily distinguished by a number of characters, and the first and the second are fairly well characterised, but the third is of a rather heterogeneous nature. For practical reasons I have included all the species referred to the first three subgroups in a single analytical key. The *Ch. cimicoides* F. group includes (cf. 20. pp. 133-134) most species recorded in the literature as *Chernes* Menge or *Trachychernes* Töm., and a good many of those described as *Lamprochernes* Töm. or *Atemnus* Can. from South America at least.

## Synopsis of Species\*.

- a. Hand with strong protuberances . . . . . 18. *Ch. armiger* Balz.
- b. Hand without protuberances.
  - a<sup>1</sup>. Fingers of palps 1·5 as long as hand; palps with partly very long, clavate hairs . . . . . 19. *Ch. echinatus* Ell.
  - b<sup>1</sup>. Fingers about as long as or shorter than hand.
    - a<sup>2</sup>. About 30 short, distinctly clavate hairs along the hindmost margin of the tergites in addition to 8-10 in front of row. Femur, which is about 1·9 as long as wide, is widened out beyond the stalk anteriorly as well as posteriorly . . . 13. *Ch. rudis* Balz.

\* Alb. Tullgren has recently described three species, which probably ought to be referred to the subgroup of *Ch. bicolor* Balz., viz. *Ch. compressus* Tullgr. (23. 1907, pp. 42-43, figs. 8 a-b), from Haiti, with a chela which is depressed from above downwards and appears triangular in dorsal view; *Ch. bocki* Tullgr. (23. pp. 44-46, figs. 9 a-b), from Bolivia, which, by its fairly long and slender palps with a long tibial stalk, shows a similarity to *Ch. venezuelanus* Balz.; and *Ch. ohausi* Tullgr. (23. pp. 72-73), from Ecuador. To the subgroup of *Ch. bicolor* Balz. probably belongs *Ch. morensis* Tullgr. (24. 1908, pp. 60-63, figs. 4-6), from Argentina, and *Ch. nordenskjöldi* Tullgr. (24. 1908, pp. 63-64, figs. 7-8), from Patagonia, both perhaps nearly related to *Ch. patagonicus* Tullgr.

- b*<sup>3</sup>. Not more than about 20 hairs along hindmost margin and not more than 6 in front of the row.
- a*<sup>3</sup>. Hairs of the hand of plumose appearance. Femur 2·3 as long as wide; chela 2·4 as long as wide, and hand 1·5 as long as finger . . . . . 29. *Ch. plumosus*, sp. n.
- b*<sup>3</sup>. Hairs of the hand not plumose.
- a*<sup>4</sup>. Cephalothorax without transverse grooves. Chela slender, at least 3 as long as wide; hand about 1·1 as long as tibia or longer and scarcely wider than the trochanter is long.
- a*<sup>5</sup>. Hand 1·5 as long as tibia. Cephalothorax smooth . 15. *Ch. gracilis* Ell.
- b*<sup>5</sup>. Hand 1·2 or less as long as tibia. Cephalothorax granular.
- a*<sup>6</sup>. Femur rather slender, 2·7 as long as wide, and tibia 2·3 as long as wide. Chela is 3 as long as wide, and hand, which is 1·4 as wide as tibia, is 1·6 as long as finger . . . . . 16. *Ch. robustus* Balz.
- b*<sup>6</sup>. Femur only 2·2 and tibia 2·1 or less as long as wide.
- a*<sup>7</sup>. Chela 3 as long as wide; tibia scarcely 2 as long as wide, and hand almost 1·3 as wide as tibia. Granulation indistinct . . . . . 17. *Ch. subrobustus* Balz.
- b*<sup>7</sup>. Chela 3·5 as long as wide; tibia 2·1 as long as wide, and hand scarcely 1·2 as wide as tibia. Granulation distinct . . . . . 14. *Ch. subgracilis*, sp. n.
- b*<sup>4</sup>. Cephalothorax with a single or with two transverse grooves.
- a*<sup>8</sup>. Chela 3·5 as long as wide, and femur 2·2 as long as wide, with small sudden convexity anteriorly. Hand 1·2 as long as tibia, 1·1 as wide, and 1·2 wider than deep . . . . . 14. *Ch. subgracilis*, sp. n.
- b*<sup>8</sup>. Chela 3 or less as long as wide; hand 1·1 or less than tibia is long.
- a*<sup>9</sup>. The chela is about 3 as long as wide, and femur from 2·6–3 as long as wide.
- a*<sup>10</sup>. Distinctly clavate hairs on palps and abdomen.
- a*<sup>11</sup>. Real eyes. Moderately clavate hairs . . . 21. *Ch. germainii* Balz.
- b*<sup>11</sup>. Ocular spots. Strongly clavate hairs . . . 20. *Ch. foliosus* Balz.
- b*<sup>10</sup>. More or less obtuse hairs on palps and abdomen.
- a*<sup>12</sup>. Hand 1·3 as long as finger and narrower than trochanter . . . . . 35. *Ch. ellingsenii*, n. sp.
- b*<sup>12</sup>. Hand as long as finger and much wider than the trochanter is long . . . . . 34. *Ch. patagonicus* Tullgr.

- b*<sup>9</sup>. If the chela is 3 as long as wide, the femur is 2·2 as long as wide.
- a*<sup>11</sup>. Abdominal tergites with only 8 hairs along hindmost margin and 2 (lateral) in front of row. The chela is 3 as long as wide; femur 2·2 as long as wide; almost smooth hand 1·1 as deep as wide and 1·2 as long as finger . . . . . 30. *Ch. nitidimanus* Ell.
- b*<sup>13</sup>. Abdominal tergites with more than 8 hairs along hindmost margin and generally 4 in front of row. Hand more or less distinctly granular.
- a*<sup>14</sup>. Femur with long strongly clavate hairs anteriorly. Hand wider than deep.
- a*<sup>15</sup>. Palps indistinctly granular. Femur, which is 2·3 as long as wide, is posteriorly beyond stalk almost straight. Cephalothorax and abdomen unicolor. Small species . . . . . 22. *Ch. antillarum*, sp. n.
- b*<sup>15</sup>. Palps coarsely granular. Femur, which is 2·7 as long as wide, is posteriorly in middle somewhat concave. Second thoracic tergite and abdomen with white spots. . . . . 25. *Ch. albomaculatus* Balz.
- b*<sup>14</sup>. Femur with obtuse or moderately clavate hairs anteriorly.
- a*<sup>16</sup>. Fingers shorter than hand deep.
- a*<sup>17</sup>. Second thoracic and abdominal tergites without white spots. Cephalothorax with single transverse groove . . . . 23. *Ch. subrudis* Balz.
- b*<sup>17</sup>. Second thoracic and abdominal tergites with white spots. Cephalothorax with two transverse grooves . . . . . 24. *Ch. bicolor* Balz.
- b*<sup>16</sup>. Fingers distinctly longer than hand deep.
- a*<sup>18</sup>. Femur about 2·5 as long as wide; hand about 1·2 as long as finger; femur at least anteriorly distinctly granular. Two transverse grooves.
- a*<sup>19</sup>. Palps coarsely granular all over, with moderately clavate hairs; hand at least as deep as wide. Second thoracic tergite with dark or white spot.
- a*<sup>20</sup>. Femur 2·5 as long as wide, tibia 2·2, and chela 2·8. Second thoracic tergite with dark median spot . . 26. *Ch. crassimanus* Balz.



- b*<sup>20</sup>. Femur 2·4 as long as wide, tibia 2, and chela 2·5. Second thoracic tergite with two lateral white spots . . . . . 27. *Ch. meinertii*, n. sp.
- b*<sup>19</sup>. Palps only distinctly granular laterally, with obtuse hairs; hand wider than deep. Second thoracic tergite unicolor . . . . . 31. *Ch. michaelsoni* Sim.
- b*<sup>18</sup>. Femur 2·2 as long as wide; palps indistinctly granular and hairs obtuse.
- a*<sup>21</sup>. Femur not attenuated and minutely granular; tibia 2 as long as wide; chela is 2·7 as long as wide, and hand 1·4 as long as finger. Femur IV. 2·5 as long as deep. . . . . 28. *Ch. subrotundatus* Balz.
- b*<sup>21</sup>. Femur attenuated and almost smooth; tibia 2·2 as long as wide; chela 3 as long as wide and hand 1·1 as long as finger. Femur IV. 3·2 as long as deep.
- a*<sup>22</sup>. Single transverse groove . . . . 33. *Ch. celerrimus*, sp. n.
- b*<sup>22</sup>. Two transverse grooves . . . . 32. *Ch. brevifemoratus* Balz.

*a*. Subgroup of CHELIFER RUDIS Balz.

*Flagellum consists of four hairs. Sexual difference observed in galea. 30 short clavate hairs along hindmost margin of tergites and 8–10 in front. Proximal joints of palps short and clumsy and chela long and slender.*

Only a single species known, to the description of which I refer.

13. CHELIFER RUDIS Balz. (Plate XXX. figs. 10 *a–f*.)

1890. Balzan, (10) pp. 423–424, tav. xiv. figs. 9–9 *c*.

1891. Balzan, (11) p. 548.

*Male.*

*Cephalothorax* (*cf.* Pl. XXX. fig. 10 *c*).—At a distance from the front margin at least equal to their diameter, are two white *ocular* spots; they are of moderate size and as a whole not well separated from the surrounding parts of the integument, even showing traces of granulation; on account of these features they are designated ocular spots, though they are similar to real eyes in the anterior part, which, at least on the left, is somewhat arched and prominent like a true lens. The cephalothorax, which is much wider behind than it is long, tapers gradually towards the eyes, but becomes rather suddenly attenuated in front. Two rather indistinct transverse *sutures*, of which the posterior is straight, while the anterior appears slightly

curved backwards in the middle, are present; the second tergite is longitudinally divided similarly to the abdominal ones. The cephalothorax is distinctly *granular* all over, or, more correctly, is covered with a mosaic of small rounded plates at least on the head and first tergite. A large number (about 100) very short, distinctly clavate *hairs* are found, of which four somewhat longer are placed along the front margin and about 20 along the hinder margin of the cephalothorax.

*Abdomen*.—The abdomen is broad and flattened and has all the tergites longitudinally divided; the sclerites are minutely *granular*, and bear a very large number of rather short distinctly clavate *hairs* along the hindmost margin, viz. about 20 in the first segments, 30 in the median, and 24 in the tenth; in addition to these the median and posterior segments possess two lateral hairs in front of the row and three more median hairs in each half, the number varying somewhat, as it is not always easy to realise the position of a hair. No "tactile" hairs seem to be present on the eleventh segment. The *genital* area is not very conspicuous; the anterior plate is granular, with a number of hairs, of almost equal length to those of the posterior plate, with many hairs in front.

*Antennæ*.—The terminal hair extends very much beyond the short and clumsy attenuated *galea*, which shows traces of a few terminal teeth (*cf.* Balzan, 10. fig. 9 c). The *flagellum* in the examined specimen consisted of only two long hairs, of which the anterior was marginally serrated, but it was probably imperfect.

*Palps* (*cf.* Pl. XXX. figs. 10, a-b, d-e).—The *maxillæ*, which, as shown in the figure, are almost triangular, are almost smooth. The palps show a mosaic of small plates similar to the cephalothorax, which is, however, rather indistinct beneath and on the hand and is completely wanting in the fingers. Numerous very short *hairs* are found, which vary in form from distinctly clavate on the trochanter to very slightly clavate on the hand. The *trochanter*, which has a very short, well-defined stalk, is 1.3 as long as wide; its anterior outline beyond the stalk is almost circular, while ventrally the posterior surface is produced into a short somewhat conical protuberance, and the dorsal into a larger more rounded one, giving a bigibbose appearance. The *femur* has a short, very well-defined stalk, beyond which it is suddenly widened out and then distinctly attenuated towards the end. It is basally much wider than the trochanter and terminally only slightly so, and is 1.9 as long as wide; the anterior outline just beyond the stalk is suddenly produced into a somewhat triangular process, which merges gradually into the almost straight more distal portion; the posterior surface beyond the stalk is very distinctly and almost perpendicularly raised, then almost straight, and at last slightly convex. The *tibia*, which has a rather short, but exceedingly well-marked stalk, is scarcely longer, but distinctly wider than the femur, and is 1.8 as long as broad; the anterior outline is first, just beyond the stalk, strongly convex and then distally almost straight; posteriorly, beyond the basal elevation, which is scarcely marked off distally but basally is separated by a deep

notch from the prominent condylus, it is at first almost straight and then slightly convex. The *chela*, which is 2.8 as long as wide, is scarcely 1.2 as broad as the trochanter is long; the *hand*, which is distinctly longer and 1.3 as broad as the tibia, is 1.7 as long as wide, 1.3 broader than deep, and 1.5 as long as the fingers, which gape slightly when closed. Both fingers bear a number of *accessory* teeth distally arranged, as shown in the figures (figs. 10 *a-b*); the immovable finger has 9 posteriorly and 3 anteriorly, while the movable has 11 and 5 respectively. The number of "spots" anteriorly on both the movable and immovable fingers is five and the same number is found on both posteriorly; the arrangement of these "spots" is shown in the figures.

*Coxæ* (cf. Pl. XXX. fig. 10 *e*).—The coxæ are very characteristic, being very elongated. The first pair are at least twice as long as broad and of almost equal breadth throughout; the two following pairs are triangular, having the interior side very short and being widened out towards the end. The *fourth pair* again are trapezoidal, being distinctly broader than the third and scarcely enlarged towards the extremity; the interior margin is much shorter than the posterior, slightly concave one and is well separated from it by the obtuse-angled postero-interior corner.

*Legs* (cf. Pl. XXX. fig. 10 *f*).—Proximal joints with scale-shaped granules. The legs bear dorsally short or rather short, more or less distinctly clavate hairs; those of the ventral surface are longer and slightly clavate or pointed; no "tactile" hairs observed. The legs are rather short and clumsy; the trochantin of the first pair of legs has a very wide articular cavity and is somewhat deeper than the tibial part; the tibia is 1.2 longer than the *tarsus*, which is only 3.2 as long as deep. The *femur* of the fourth pair of legs is 2.1 as long as deep, 1.1 as long as tibia, and scarcely 1.1 lower than tarsus is long.

*Colour*.—The palps and the cephalothorax are light brown; the abdominal sclerites are more yellowish brown.

*Measurements*.—Cephalothorax 1.265 (1.495); abdomen 3.450 (2.300) mm.

Palps: trochanter 0.690 (0.529); femur 1.173 (0.610); tibia 1.196 (0.667); hand 1.380 (0.815), depth 0.635; finger 0.920 mm.

Leg I.: femur 0.745 (0.296), trochantin 0.175 (0.315); tibia 0.532 (0.198); tarsus 0.448 (0.140) mm.

Leg IV.: femur 1.034 (0.502); tibia 0.911 (0.254); tarsus 0.532 (0.178) mm.

#### *Female.*

*Cephalothorax* (Pl. XXX. fig. 10 *c*).—Two real eyes are present of a somewhat peculiar shape, being rather low behind, but well curved and very prominent in front.

*Abdomen*.—The longitudinal line is very broad in the median segments, decreasing towards the extremities, especially in front.



*Antennæ*.—The *galea* extends somewhat beyond the terminal hair and seems to bear a few short teeth in the imperfect specimen examined (*cf.* Balzan, 10. fig. 9 c, ♀). The *flagellum* consists of four hairs, of which only the anterior has marginal teeth (*cf.* Balzan, fig. 9 a).

*Palps* (Pl. XXX. fig. 10 d).—The palps are only slightly different from those of the male in the proportions between the joints. The *femur* is only 1·8 as long as wide, and much more attenuated, terminally being scarcely as wide as the trochanter; the *tibia* is only 1·7 as long as wide and more strongly convex anteriorly; the *chela* is 3 times as long as wide; the hand is only 1·2 wider than the tibia and 1·4 longer than the *fingers*, which do not gape when closed. The number of the *accessory* teeth is the same as in the male and the marginal teeth are much better developed. The number of the “*spots*” is almost the same as in the male, but the arrangement shows a few interesting modifications, the most important being that the immovable finger has a single “spot” anteriorly behind the basal hair, and posteriorly five “spots” close together and a single much larger one, standing more apart, while the movable finger possesses two pairs of spots, one behind the other, and a single spot more apart.

*Coxæ* (Pl. XXX. fig. 10 e).—The fourth pair are less slender and the posterior margin only a little longer than the interior.

*Legs* (Pl. XXX. fig. 10 f).—The legs perhaps less slender, especially the tarsus of the first pair of legs, which is only three times as long as deep.

*Colour*.—The colour is distinctly darker: dark reddish-brown palps and dark brown cephalothorax and abdominal sclerites.

*Measurements*.—Cephalothorax and abdomen as in the male.

Palps: trochanter 0·647 (0·506); femur 1·012 (0·575); tibia 1·035 (0·598); hand 1·226 (0·690), depth 0·540; finger 0·897 mm.

Leg I.: femur 0·661 (0·266), trochantin 0·170 (0·289); tibia 0·494 (0·182); tarsus 0·414 (0·137) mm.

Leg IV.: femur 0·950 (0·437); tibia 0·850 (0·220); tarsus 0·502 (0·170) mm.

*Material &c.*—Of this very interesting species I have only examined two specimens, viz. a female collected by E. v. Benzon in Monte Rita (Brazil?) and a male collected by Dr. W. Sörensen in Argentine (Riacho dell' Oro). Balzan's specimens are from Paraguay, living under the bark of trees.

*Remarks*.—The species described is certainly identical with Balzan's, in spite of slightly different proportions of the joints of the palps, somewhat smaller size, greater number of hairs in front of the row and in the row on the median tergites; a rather curious difference is found in the flagellum, which has the three posterior hairs simple, not dentated as in Balzan's specimens.

## b. Subgroup of CHELIFER SUBROBUSTUS Balz.

*Flagellum consists of three hairs. Cephalothorax generally with some ocular spots and without transverse grooves or with a median one. The proximal joints of palps short and clumsy in contradistinction to long and slender chela, which has hand much longer than tibia. Tarsal tactile hair at least a half removed from the base.*

With the very scanty material at my disposal it is very difficult to mark this group sharply off from the following, but I am, nevertheless, practically convinced that it is quite a natural one. The shape of the cephalothorax, generally without transverse grooves, the contrast between the slender chela, with hand which is distinctly larger than the finger and much longer than the tibia, and the clumsy femur, together with the elongated coxæ, give these species a peculiar appearance, somewhat similar to that of *Chelifer rudis* Balz.\* The three previously known species referred to this group were originally described as belonging to *Atemnus* Can., but I think that the presence of accessory teeth on fingers of palps and the position of the tarsal "tactile" hair, well removed from base, make it necessary to place these species apart from *Ch. nidificator* Balz. &c.

## 14. CHELIFER SUBGRACILIS, sp. n. (Plate XXX. figs. 11 a-b.)

*Female.*

*Cephalothorax*.—Two fairly distinct *ocular* spots. The cephalothorax, which is somewhat longer than wide, has the membranous cucullus which covers the base of the antennæ very well developed; only the anterior transverse *groove*, which is slightly curved backwards in the middle and fairly prominent, is found. The integument is minutely, but distinctly granular, except in the hindmost part of the second tergite; the hairs are short and slightly clavate.

*Abdomen*.—The abdomen, which is not very slender and somewhat depressed, has all the tergites except the hindmost part of the eleventh divided by a wide longitudinal band. The sclerites are indistinctly granular with scale-shaped granules; and the tergites bear from 12–16 generally rather short and slightly clavate *hairs* along the hindmost margin, in addition to two lateral ones distinctly, and two median ones, very indistinctly, in front of the row. A moderately big round spot, covered with numerous short hairs, is observed in front of the vulva. The dorso-ventral integument is beset with densely placed, parallel, undulated, longitudinal ridges.

*Antennæ*.—The rather slender *galea*, which possesses six short terminal branches, scarcely extends beyond the terminal hair.

*Palps* (Pl. XXX. figs. 11 a-b).—The *maxillæ* are almost smooth in the middle, but granular laterally; the *trochanter*, *femur*, and in a less degree the *tibia*, are distinctly

\* Marked differences from this species are, however, found in number of tergal hairs, &c.

granular above and laterally, but almost smooth below, while the hand is partly quite smooth and partly indistinctly granular. The *hairs* of the three proximal joints are short and obtuse, while those of the hand are more simple. The *trochanter*, which is as long as wide, is anteriorly regularly and distinctly convex in the middle and terminates with a slightly marked convexity; posteriorly it is suddenly produced into a rounded protuberance and dorsally into a rather low, somewhat conical protuberance. The *femur* has a very short and well-defined stalk, beyond which it is distinctly attenuated towards the extremity. It is 2·2 as long as wide; both margins are almost straight beyond the stalk, from which the anterior outline is slightly raised, while the posterior is very distinctly and abruptly so. The *tibia*, which has a short and well-defined stalk, is a little longer and wider than the femur, and 2·1 as long as wide; the anterior outline is basally moderately convex and then very slightly concave; the posterior outline beyond the basal elevation, which is separated from the prominent condylus by a deep notch, but which is not limited distally, is first almost straight and then moderately convex. The *chela*, which is about 3·5 as long as wide, is scarcely wider than the trochanter is long; the *hand*, which is at least 1·1 as long as the tibia, but scarcely 1·2 wider, is about twice as long as broad, almost 1·2 as wide as deep, and 1·4 as long as the fingers, which are much longer than hand is wide and do not gape when closed; the exterior outline of the hand just beyond the stalk is very abruptly produced and then becomes almost straight, while the interior is more gradually convex; the dorsal and ventral margins are almost straight. Both fingers bear anteriorly 2 *accessory* teeth near to the tip, while the number posteriorly is much greater, viz. about 8 in the immovable and 5 in the movable finger in the distal half. Anteriorly the immovable finger has only a single "*spot*" placed between the tactile hairs; posteriorly it has a single "*spot*" placed between the three basal tactile hairs which stand close together, and two just beyond the median tactile hair; while the movable finger has two "*spots*" at least, placed between the basal and the median tactile hairs, and a single one beneath and in front of the latter.

*Coxæ*.—The *coxæ* show perhaps greatest similarity to those of *Ch. rudis* Balz., but differ by their less elongated shape; the second and the third pair are distinctly widened out towards the extremity and are of somewhat triangular appearance, as the inner margins, especially those of the second pair, are short. The *fourth pair*, which are somewhat trapezoidal and scarcely widened out towards the end, have the inner margin, which is about as long as the somewhat concave hinder margin, passing gradually into the latter.

*Legs*.—The proximal joints are indistinctly granular. The hairs of the dorsal side are short and obtuse or dentated; those of the ventral are longer, pointed, and more or less simple. The tarsal "*tactile*" hair is two-thirds removed from the base and as long as this distance. The legs are fairly long and slender, and have the trochantin



of the first pair much deeper than the tibial part, while the tibia is 1·3 longer than the *tarsus*, which is 3·3 as long as deep. The *femur* of the fourth pair of legs is 2·4 as long as deep, 1·2 as long as the tibia, and 1·3 lower than the *tarsus* is long.

*Colour*.—The palps are dark reddish brown; the cephalothorax, which has a somewhat lighter hinder margin, is brown and so are the tergal sclerites.

*Measurements*.—Cephalothorax 1·104 (0·989); abdomen 2·80 (1·73) mm.

Palps: trochanter 0·506 (0·355); femur 0·897 (0·410); tibia 0·910 (0·437); hand 1·035 (0·500), depth 0·414; fingers 0·713 mm.

Leg I.: femur 0·623 (0·217), trochantin 0·114 (0·236); tibia 0·456 (0·137); tarsus 0·342 (0·103) mm.

Leg IV.: femur 0·874 (0·365); tibia 0·707 (0·198); tarsus 0·426 (0·129) mm.

*Material*.—Of this species I have examined a single female from Brazil mounted together with *Ch. imperator*, sp. n., &c.

This species seems to differ from the three following by the presence of a fairly distinct median transverse groove; it differs besides from *Ch. gracilis* Ell. by the granular cephalothorax, the slightly clavate hairs, and by the hand, which is scarcely 1·1, not 1·5, as long as the tibia; from *Ch. robustus* Balz. by the less slender femur, being 2·2 instead of 2·7 as long as wide, and more slender chela, being 3·5 instead of 3 as long as wide; from *Ch. subrobustus* Balz. by much more clumsy tibia and more slender chela, which is 3·5 instead of scarcely 3 as long as wide and has only a few spots anteriorly on the movable finger.

#### 15. CHELIFER GRACILIS Ell.

1902. Ellingsen, (15) pp. 148–149.

Cephalothorax smooth, without transverse *grooves*, and with short simple hairs. *Femur*, which is distinctly attenuated, is anteriorly proximally slightly convex and then distinctly concave and posteriorly “régulièrement et médiocrement convexe”; *tibia* with strong stalk and “presque régulièrement ovale”; the *hand*, which is somewhat wider and 1·5 as long as the tibia, is 1·5 as long as the finger.—Ecuador.

This species is distinguished from the others of this group by the very long hand.

#### 16. CHELIFER ROBUSTUS Balz.

1890. Balzan, (10) pp. 418–420, tav. xiii. figs. 6–6 b.

1891. Balzan, (11) p. 548.

Cephalothorax minutely granular, without transverse *grooves* and with short dentated hairs. The *femur*, which scarcely seems to be attenuated, is 2·7 as long as wide; the *tibia*, which is 2·3 as long as wide, has outlines slightly convex; the *hand*, which is scarcely 1·1 as long as, but 1·4 as wide as, the tibia, is 1·6 as long as the finger; the chela is about 3 as long as wide.—Paraguay and Brazil.

17. CHELIFER SUBROBUSTUS Balz. (Plate XXX. figs. 12 *a-b*.)1891. *Atemnus subrobustus* Balzan, (11) pp. 512-513, pl. 9, figs. 3-3 *a*.

*Cephalothorax*.—The cephalothorax, which is about as long as wide, has no transverse grooves, and is minutely, not very distinctly granular.

*Abdomen*.—The hairs are moderately long, pointed or obtuse.

*Antennæ*.—The terminal hair extends slightly beyond the rather short and clumsy *galea*, which is exactly like Balzan's figure 3 *a* and with six short branches.

*Palps* (Pl. XXX. figs. 12 *a-b*).—The *maxillæ* are smooth. The palps are minutely granular, with the exception of the almost smooth chela; the dorsal and lateral surfaces of the trochanter and femur are fairly distinctly granular, while the lower surfaces and the tibia are less distinctly so. The hairs seem to be rather short and slightly obtuse. The *trochanter*, which is about 1.5 as long as wide, is anteriorly strongly convex and posteriorly produced into a rounded protuberance; the low dorsal tubercle is somewhat conical. The *femur* has a very short and well-defined stalk, beyond which it is somewhat attenuated. It is about 2.1 as long as wide; the anterior outline is slightly convex and then concave, while the posterior is abruptly raised and then almost straight. The *tibia*, which has a very short and well-defined stalk, is longer and wider than the femur and scarcely twice as long as broad; anteriorly it is distinctly convex and then a trifle concave, while the posterior outline, beyond the well-marked basal elevation, which is separated by a deep notch from the prominent condylus, is first almost straight and then moderately convex or obtuse-angled. The *chela*, which is about 3 as long as wide, is 1.1 broader than the trochanter is long; the *hand*, which is 1.1 as long as, but 1.3 wider than, the tibia, is almost 1.8 as long as wide, 1.3 broader than deep, and about 1.4 as long as the fingers, which are much (1.3) longer than the hand is wide and gape a trifle when closed; the hand beyond the stalk is very abruptly raised posteriorly, but anteriorly, as well as dorsally and ventrally, more gradually convex, and then almost straight (*cf.* Balzan's good figure 3 of palps, pl. 9). Anteriorly no *accessory* teeth were observed, but posteriorly about 15 in both fingers (figs. 12 *a-b*). The immovable finger bears anteriorly about eight "*spots*" arranged as figured and posteriorly a similar number, while the movable finger has none.

*Coxæ*.—The second and third pair are longer and more slender than those of *Ch. subgracilis*, sp. n., but less so than those of *Ch. rudis* Balz. The fourth pair are somewhat triangular, as the inner somewhat shorter margin merges into the hinder and as they are widened out towards the extremity.

*Legs*.—Only the femur of the fourth pair distinctly granular, the other joints smooth or indistinctly so. The hairs of the dorsal side of the legs are short, obtuse, and with a few teeth, while those of the ventral side are long, pointed, and more or less simple. A median tarsal "*tactile*" hair seems to be present. The legs are rather short and clumsy; the trochantin of the first pair is deeper than the tibial part and the

tibia is 1.3 as long as the *tarsus*, which is 3.5 as long as deep; the *femur* of the fourth pair of legs is scarcely 2.2 as long as deep, 1.2 as long as the tibia, and 1.1 lower than the tarsus is long.

*Colour*.—The palps are reddish brown.

*Measurements*.—Body about 4 mm. long without antennæ.

Palps: trochanter 0.483 (0.335); femur 0.805 (0.380); tibia 0.851 (0.437); hand 0.943 (0.540), depth 0.437; finger 0.690 mm.

Leg I.: femur 0.600 (0.205), trochantin 0.091 (0.215); tibia 0.410 (0.126); tarsus 0.312 (0.091) mm.

Leg IV.: femur 0.798 (0.372); tibia 0.661 (0.182); tarsus 0.410 (0.122) mm.

*Material*.—Of this species I have examined a single damaged specimen (♀) from New Granada (Keyserling Coll.); the typical specimen is from Venezuela.

*Remarks*.—That the described specimen belongs to *Ch. subrobustus* Balz., I regard as quite certain, as the differences are only trivial; it differs from *Ch. robustus* Balz. by the less slender femur and tibia and from *Ch. gracilis* Ell. by the granular cephalothorax and less slender hand.

#### c. Subgroup of CHELIFER BICOLOR Balz.

*Flagellum consists of three hairs. Cephalothorax generally with ocular spots and two transverse grooves. The hand seldom much longer than the tibia. The tarsal "tactile" hair is more than one-fourth removed from base.*

This group contains species which in many respects differ greatly among themselves. It includes, in fact, all those which cannot be naturally placed in any of the three preceding groups. Nevertheless, several of the species show close relationship to each other: *Ch. bicolor* Balz., *Ch. subrudis* Balz., &c., are nearly related to each other, showing similarity in the structure of the male genital organs, in the shape of the palps, and the colour of the second thoracic tergite; *Ch. patagonicus* Tullgr. and *Ch. ellingsenii*, sp. n., are nearly related to each other as well as to *Ch. elegans* Balz., referred to the following subgroup.

#### 18. CHELIFER ARMIGER, Balz.

1891. *Trachychernes armatus* Balzan, (11) pp. 527–528, pl. 10. fig. 18.

Cephalothorax minutely granular, with two transverse *grooves*. Abdomen with long pinnate hairs along hindmost margin and six in front. The *hairs* of palps dentated or pinnate; the *femur* at least 3 as long as wide; *tibia*, which is about 2.5 as long as wide, has moderately convex outlines. *Hand*, which is scarcely longer than finger, of a most remarkable shape, being provided with three conical *protuberances*.—Amazons and Peru.



## 19. CHELIFER ECHINATUS Ell.

1904. Ellingsen, (16) pp. 2-4.

Cephalothorax strongly granulose, with two strong transverse *grooves*. Abdomen with fairly long strongly clavate *hairs*. Hairs of palps posteriorly short, strongly clavate, anteriorly very long, somewhat thickened; the *femur* is 2·5 as long as wide; the *tibia* with long stalk and strongly convex outlines; *fingers* 1·5 as long as hand, which is 1·5 as wide as tibia.—Patagonia.

## 20. CHELIFER FOLIOSUS Balz.

1890. Balzan, (10) pp. 427-428, tav. xiv. figs. 12-12 c<sup>III</sup>.

1891. Balzan, (11) p. 548.

Cephalothorax minutely granular, with two distinct *grooves*. Abdomen with granular sclerites and with clavate *hairs*. *Hairs* of palps long and strongly clavate; the *femur* is about 3 as long as wide; the *tibia*, which is 2·2 as long as wide, has lateral outlines moderately convex. The *hand*, which is distinctly longer and 1·2 wider than the tibia, is about 1·2 as long as fingers.—Paraguay.

## 21. CHELIFER GERMAINII Balz.

1890. Balzan, (10) pp. 424-426, tav. xiv. figs. 10-10 c.

1891. Balzan, (11) p. 548.

1905. Ellingsen, (17) pp. 1-3.

Two distinct *eyes*. Cephalothorax minutely granular, with two *grooves*. Abdomen with granular sclerites and distinctly clavate *hairs*. Palps granular, with distinctly clavate hairs; the *femur* is 3·1 as long as wide; the *tibia*, which is 2·4 as long as wide, has lateral outlines moderately convex. The *hand*, which is somewhat longer and 1·4 wider than tibia, is 1·2 as long as finger. The second thoracic tergite is, according to Ellingsen, whitish with a dark spot in middle.—Matto Grosso and Ecuador.

Balzan and Ellingsen refer this species to their subgenus *Chelifer*; on account of the structure of flagellum, galea, and colour, I think it is most naturally placed in this group in spite of real (?) eyes. Until the structure of fingers and legs has been studied, the question cannot be settled definitively.

## 22. CHELIFER ANTILLARUM, sp. n. (Plate XXX. figs. 13 a-b.)

*Cephalothorax*.—The *ocular* spots are very indistinct. The cephalothorax, which is somewhat longer than wide, has the anterior almost straight transverse *line* fairly distinct, in contradistinction to the slightly concave, almost obsolete, posterior one. The integument is distinctly granular, at least in front, and bears rather short, distinctly clavate hairs.

*Abdomen*.—The long and slender abdomen has apparently all the tergites, except part of the eleventh, longitudinally divided. The sclerites have rather indistinct scale-shaped *granulations*, and the tergites bear along their hinder margin 8–10 more or less long and slender distinctly clavate *hairs*, in addition to two lateral hairs distinctly in front of row and two median indistinctly so. The eleventh sternite has a pair of rather short “tactile” hairs; similar ones probably found on corresponding tergite.

*Antennæ*.—The fairly slender *galea*, which has about six terminal teeth, extends slightly beyond the terminal hair.

*Palps* (Pl. XXX. figs. 13 *a-b*).—The *maxillæ* are almost smooth. The palps are indistinctly granular and striated above, below smooth but not polished. The hairs, which vary much in length, are more or less strongly clavate, at least in the three proximal joints, and basally in the hand, with the exception of a few which are only dentated; the clavate ones of the hand pass gradually into the pointed and more or less simple ones of the fingers. The *trochanter*, which is 1·4 as long as wide, is moderately convex anteriorly and slightly produced posteriorly; dorsally it is prolonged into a fairly high, somewhat rounded protuberance. The *femur* has a short and well-defined stalk, beyond which it tapers towards the extremity. It is 2·3 as long as wide; anteriorly it is just beyond the base a trifle produced and then almost straight, and posteriorly the outline beyond the rather abrupt basal convexity is almost straight and then slightly convex. The *tibia*, which has a short not very well-defined stalk, is as long as and a little wider than the femur, and just twice as long as broad; the anterior outline beyond the stalk is rather abruptly and strongly convex and then in a slight degree concave, but the posterior beyond the very small condylus is almost straight and then moderately convex. The *chela*, which is 2·6 as long as wide, is about 1·1 as broad as the trochanter is long; the *hand*, which is scarcely as long as the tibia, but 1·3 broader, is 1·5 as long as wide, almost 1·1 as wide as deep, and 1·3 as long as fingers, which are somewhat longer than the hand is wide and which do not gape when closed; the lateral and the dorsal outlines are moderately convex, while the ventral is only slightly so. Anteriorly the immovable finger has a single *accessory* tooth distinctly beyond the middle; posteriorly both fingers possess a single distal tooth (fig. 13 *b*). Anteriorly the immovable finger has the median tactile hairs placed the one above the other, and somewhat behind the lower there is a large “spot”; posteriorly both fingers have three spots, arranged as shown in figure.

*Coxæ*.—The fourth pair are trapezoidal, only in a slight degree widened out towards the end, much longer than broad, and have the interior margin shorter than and fairly well separated from the posterior.

*Legs*.—The proximal joints are smooth. The long hairs are dorsally in the fourth pair of legs strongly clavate and slightly curved, and in the first pair only slightly convex; the ventral hairs are pointed and more or less simple. The tarsal “tactile” hair a little more than two-thirds removed from the base and as long as the distance to

the tip. The legs are short and clumsy, and the *trochantin* of the first pair of legs is scarcely deeper than the femur proper, while the tibia is a trifle longer than the *tarsus*, which is 3.6 as long as deep; the *femur* of the fourth pair of legs is 2.5 as long as deep, 1.2 as long as the tibia, and 1.7 lower than tarsus long.

*Colour*.—The palps are reddish brown; the cephalothorax and abdominal sclerites are yellowish brown.

*Measurements*.—Cephalothorax 0.483 (0.437); abdomen 1.380 (0.782) mm.

Palps: trochanter 0.230 (0.161); femur 0.414 (0.175); tibia 0.414 (0.207); hand 0.407 (0.265), depth 0.245; finger 0.299 mm.

Leg I.: femur 0.274 (0.099), trochantin 0.061 (0.099); tibia 0.198 (0.072); tarsus 0.190 (0.053) mm.

Leg IV.: femur 0.319 (0.129); tibia 0.266 (0.076); tarsus 0.220 (0.065) mm.

*Material*.—Of this species I have examined a single female, infected with black round bodies, perhaps spores of fungi: collected in St. Vincent by E. Simon.

*Remarks*.—This species, which is well characterised by its small size, the long, strongly clavate hairs of the palps, and the short distinctly convex tibia, appears to be similar to *Ch. foliosus* Balz., which, however, has the palps much more slender, the femur being, for instance, almost three times as long as wide and of almost double the size.

### 23. CHELIFER SUBRUDIS Balz. (Plate XXX. figs. 14 a-f.)

1891. *Trachychernes subrudis* Balzan, (11) pp. 321–322, pl. 10. figs. 13–13 b.

#### *Male.*

*Cephalothorax*.—Small distinct *ocular* spots are present. The cephalothorax, which is much longer than wide, has a median fairly distinct transverse *groove* slightly curved backwards in the middle, and shows a trace of a hindmost one. The integument is minutely granular, and the hairs are short and obtuse.

*Abdomen*.—The long slender abdomen is almost three times as long as wide and has all the tergites, with the exception of the first and the eleventh, longitudinally divided. The sclerites are distinctly granular and with from 10–14 fairly long and slightly clavate or obtuse *hairs* along the hindmost margins as well as generally four hairs in front of the row. The eleventh tergite has a pair of “tactile” hairs. The *genital* area has a long anterior and a short posterior plate, with a wide transverse split between.

*Antennæ* (cf. Pl. XXX. fig. 14 a).—The terminal hair extends in a slight degree beyond the rather short and clumsy *galea*, which has six short distal branches. The *flagellum* consists of three hairs, of which the anterior has several marginal teeth and the two behind a few only (fig. 14 a).



*Palps* (cf. Pl. XXX. figs. 14 b-c).—The *maxillæ* are smooth and glossy; the palps are minutely and not very distinctly granular above, below very indistinctly; the short *hairs* are obtuse or dentated. The *trochanter*, which is 1.5 as long as wide, is anteriorly moderately convex and posteriorly very slightly produced; dorsally it is very slightly raised (in contradistinction to Balzan's description, but similar to his fig. 13). The *femur* has an extremely short stalk, beyond which it is distinctly widened out to a point somewhat behind the tip. It is twice as long as wide; the anterior outline is at first very slightly convex and then distally concave, while the posterior and especially the dorsal outlines (on account of the very short and clumsy shape it is very difficult sharply to distinguish between these two margins) are at first rather abruptly convex, then very slightly concave, passing again finally into a slight convexity. The *tibia*, which has a short well-marked stalk, is somewhat longer and broader than the femur, and scarcely twice as long as broad; it is much deeper than wide; the anterior outline, beyond the stalk, is abruptly convex, almost protuberant, and then almost straight; the posterior outline, beyond the fairly prominent condylus and slightly marked basal elevation, is at first for a short distance almost straight and then slightly convex; the dorsal outline is slightly produced and the ventral is moderately convex. The *chela*, which is 2.7 as long as wide, is scarcely 1.1 as broad as trochanter is long; the *hand*, which is about as long as but 1.3 wider than the tibia, is 1.5 as long as wide, but only 1.1 as long as deep, almost 1.4 deeper than wide, and 1.2 as long as fingers, which are 1.1 shorter than hand deep and do not gape when closed; the lateral outlines of the hand as well as the ventral are gradually and moderately convex, while the dorsal outline just beyond the stalk is very high and very steep, even slightly inclining backwards and then slightly convex. The fingers bear anteriorly a few *accessory* teeth distally, and posteriorly a number from the middle to the tip; the number and arrangement of "*spots*" could not be investigated on account of the black colour of the chela.

*Coxæ*.—The second and the third pair are slightly enlarged, the former being very slightly narrowed basally. The fourth pair are quadrangular in shape, slightly widened out, and with the inner margin somewhat shorter than the slightly concave hinder, not well limited from it.

*Legs* (cf. Pl. XXX. figs. 14 e-f).—The proximal joints are very indistinctly granular only. The fairly long hairs are dorsally dentated and obtuse (sometimes slightly clavate), but ventrally pointed and more or less clumsy; a short tarsal "*tactile*" (?) hair, scarcely three-fourths removed from base and a little longer than its distance to the tip. The legs are very short and clumsy; the tibial part of the femur of the first pair of legs is a little deeper than the trochantin, and the tibia is distinctly (1.1) longer than the *tarsus*, which is scarcely 3 as long as deep. The *femur* of the fourth pair of legs is 2.2 as long as deep, 1.3 as long as the tibia, and 1.2 lower than the tarsus is long.

*Colour*.—The palps are dark brown, and so is the cephalothorax, while the abdominal sclerites, placed within white skin, are light brown.

*Measurements*.—Cephalothorax 0.851 (0.690); abdomen 3.100 (1.035) mm.

Palps: trochanter 0.460 (0.322); femur 0.713 (0.368); tibia 0.736 (0.391); hand, 0.759 (0.506), depth 0.690; finger 0.621 mm.

Leg I: femur 0.502 (0.220), trochantin 0.091 (0.213); tibia 0.357 (0.157); tarsus 0.327 (0.114) mm.

Leg IV.: femur 0.737 (0.334); tibia 0.578 (0.198); tarsus 0.410 (0.144) mm.

#### *Female.*

*Antennæ* (Pl. XXX. fig. 14 *a*).—The *galea* is a little longer and extends in a slight degree beyond the terminal hair.

*Palps* (Pl. XXX. figs. 14 *b-c*).—The palps are only in a very slight degree different; the ventral outline of the *tibia* is slightly and the dorsal fairly distinctly produced (fig. 14 *c*); the *hand* is only 1.4 as long as wide and scarcely 1.1 as long as deep, scarcely 1.3 deeper than wide. Of “*spots*” at least three are found at the base of the movable finger anteriorly.

*Coxæ* (Pl. XXX. fig. 14 *d*).—The fourth pair are distinctly different from the corresponding pair of the male, being as wide basally as terminally, and with the inner margin separated from the hinder by a distinct obtuse angle and much longer; the whole coxa trapezoidal.

*Legs* (Pl. XXX. figs. 14 *e-f*).—The legs are perhaps a trifle less slender.

*Colour*.—Body and palps a little lighter.

*Measurements*.—Cephalothorax 0.989 (0.805); abdomen 4.25 (1.75) mm.

Palps: trochanter 0.506 (0.345); femur 0.782 (0.391); tibia 0.805 (0.414); hand 0.828 (0.598), depth 0.782; finger 0.690 mm.

Leg I.: femur 0.532 (0.236), trochantin 0.099 (0.228); tibia 0.380 (0.167); tarsus 0.350 (0.122) mm.

Leg IV.: femur 0.810 (0.368); tibia 0.616 (0.220); tarsus 0.433 (0.160) mm.

*Material &c.*—Of this species I have examined a female collected in Caracas by Mr. Stroll and a male collected at Los Tejas (Caracas) by Dr. Meinert. Balzan's specimen is from Venezuela.

*Remarks*.—The insignificant differences found between Balzan's description and my specimens are scarcely worth recording, except that he writes “*Digiti . . . manu multo breviores.*” This species may easily be distinguished from all other species known to me by the curious palps, especially the excessively deep chela. In these, as well in other respects, it shows a certain similarity to *Ch. bicolor* Balz., from which it, however, differs by colour and shape of coxæ and legs.

## 24. CHELIFER BICOLOR Balz. (Plate XXX. figs. 15 a-e.)

1891. *Trachychernes bicolor* Balzan, (11) pp. 524-525, pl. 10. figs. 16-16 a.*Male.*

*Cephalothorax*.—Small, fairly distinct *ocular* spots are found. The cephalothorax, which is slightly longer than wide, has two fairly distinct, almost straight transverse *grooves*. The integument is distinctly granular, except on the two white spots of the second tergite, and bears a number of short, slightly clavate hairs.

*Abdomen* (Pl. XXX. fig. 15 c).—The abdomen is long and slender, and all its tergites are longitudinally divided; the dark spots of the tergites are granular, and from 10-12 moderately long, obtuse or slightly clavate *hairs* are placed along the hinder margin of the tergites, which in addition possess two lateral and two median hairs in front of the row, the last-mentioned not very distinctly so. The eleventh tergite has a pair of rather short "tactile" hairs. All the sternal sclerites are well developed, and all but the eleventh longitudinally divided by a broad band. The *genital* area had the anterior plate much longer than the posterior (fig. 15 c).

*Antennæ*.—The terminal hair extends distinctly beyond the very short, somewhat pointed *galea*, which has a tiny median as well as two terminal teeth.

*Palps* (Pl. XXX. figs. 15 a-b).—The *maxillæ* are almost smooth in the middle, but laterally granular; the palps are minutely granular, except the fingers and the hand below; the hairs of the proximal joints are obtuse and dentated, rather short, and passing over into the moderately long, simple, or almost simple of the hand and fingers. The *trochanter*, which is 1.5 as long as wide, is anteriorly moderately convex, while posteriorly it is slightly produced beyond the stalk; dorsally it is produced into a somewhat conical protuberance, only slightly pronounced. The *femur* has a short and well-defined stalk, beyond which it is distinctly widened out to a point somewhat beyond the middle and then becomes slightly attenuated. It is 2.3 as long as wide; the anterior outline is slightly convex and then concave, while the posterior outline is rather abruptly convex beyond the stalk, in the middle slightly concave, and then a trifle convex. The *tibia*, which has a rather short and fairly well-marked stalk, is a little longer and wider than the femur and 2.2 as long as wide; anteriorly beyond the stalk it is convex and then slightly concave terminally, while the posterior outline beyond the condylus is almost straight, as the basal elevation is very insignificant, and then slightly convex. The *chela*, which is about 2.4 as long as wide, is 1.4 broader than the trochanter is long; the hand, which is as long as but 1.5 wider than the tibia, is 1.4 as long as broad, but only 1.1 longer than deep, is 1.2 deeper than broad and about 1.4 longer than finger, which is a trifle longer than the hand is broad; the lateral outlines are moderately convex and so is the ventral, but the dorsal is almost semicircular. The number of *accessory* teeth seems to be fairly constant, viz. anteriorly about five on both fingers and posteriorly about ten.



The number of "*spots*" shows rather marked variations, at least anteriorly, where I have examined a good many specimens, but their arrangement is nevertheless fairly characteristic; the immovable finger possesses anteriorly, in the area between the four tactile hairs and near to it, from 15–20 "*spots*," while the movable finger has two or three; the immovable finger has posteriorly about six "*spots*" basally and a single median one, and the movable finger five in the basal third.

*Coxæ* (Pl. XXX. fig. 15 *c*).—The coxæ of the second and third pair are both widened out towards the extremity; the second pair are rather suddenly restricted towards the base and consequently the interior margin is shorter than that of the third pair. The *fourth pair*, which are widened out towards the end, have the short interior margin gradually merging into the posterior, almost straight one.

*Legs*.—The proximal joints are indistinctly granular. Hairs of dorsal side slightly clavate or obtuse and rather short; those of ventral surface are longer, pointed, and almost simple or completely so; the tarsal "*tactile*" hair is at least three-fourths removed from the base and distinctly longer than its distance to tip. The trochantin of the first pair is scarcely as deep as the femur proper, and the tibia is almost 1.1 as long as the *tarsus*, which is 3.9 as long as deep. The *femur* of the fourth pair of legs is 2.2 as long as deep, 1.1 as long as the tibia, and 1.5 lower than the *tarsus* is long; the *tibia* of the fourth pair of legs is somewhat club-shaped, being distinctly convex terminally, not as usually in the middle.

*Colour*.—Palps dark brown, almost black, with the stalks and extremities lighter; the head, first thoracic tergite and a median spot on the second are blackish, while the lateral parts of the second tergite are white. The abdominal tergites have on each side a black spot near to the middle, a brown one more laterally placed, and a brown band along the front margin of the tergite, connecting the two; the rest of the dorsal surface is white; the sternites are brown and divided by a longitudinal white band.

*Measurements*.—Cephalothorax 0.759 (0.736); abdomen 1.886 (0.989) mm.

Palps: trochanter 0.368 (0.240); femur 0.690 (0.299); tibia 0.713 (0.322); hand 0.713 (0.515), depth 0.635; finger 0.529 mm.

Leg I.: femur 0.418 (0.167), trochantin 0.076 (0.160); tibia 0.319 (0.110); tarsus 0.296 (0.076) mm.

Leg IV.: femur 0.532 (0.243); tibia 0.464 (0.129); tarsus 0.357 (0.099) mm.

#### *Female.*

*Abdomen* (Pl. XXX. fig. 15 *e*).—The number of hairs in the hindmost row of the tergites is somewhat greater (from 12–14) and the median hair is placed more distinctly in front of the row. The abdominal sclerites are not well pronounced ventrally; a large number of hairs in an elongated area in front of the sexual area (fig. 15 *e*).

*Antennæ*.—The *galea* extends slightly beyond the terminal hair and has three pairs of distal short branches (*cf.* Balzan, fig. 16 *a*).

*Palps* (Pl. XXX. fig. 15 *d*).—The proximal joints of the palps scarcely differ, but the *chela* is distinctly different, being 2·6 as long as wide; the *hand*, which is 1·5 as long as wide and 1·4 as long as deep, is only 1·1 deeper than broad and 1·5 longer than the fingers, which are somewhat longer than the hand is broad; the dorsal outline is distinctly convex, but far from being semicircular. The number of *accessory* teeth seems to be somewhat smaller; the difference in arrangement of spots is not greater than that between different specimens of the male.

*Coxæ* (Pl. XXX. fig. 15 *e*).—The fourth pair are distinctly wider, with the inner margin only a little shorter than the hinder.

*Legs*.—The legs seem to be somewhat longer and more slender, the *femur* of the fourth pair being, for instance, 2·6 as long as deep and 1·6 lower than tarsus is long; the tibia of the fourth pair has the usual shape and is four times as long as deep.

*Colour*.—The palps and the cephalothorax are somewhat lighter and so are the brown areas on the abdominal tergites, which are somewhat larger; the median and lateral dark spots are not only fused in front but also behind, so that a dark area with a white spot in the middle is established.

*Measurements*.—Cephalothorax 0·713 (0·736); abdomen 2·875 (1·265) mm.

Palps: trochanter 0·368 (0·240); femur 0·713 (0·310); tibia 0·736 (0·335); hand 0·782 (0·506), depth 0·565; finger 0·529 mm.

Leg I.: femur 0·456 (0·175), trochantin 0·084 (0·182); tibia 0·342 (0·118); tarsus 0·319 (0·080) mm

Leg IV.: femur 0·631 (0·243); tibia 0·547 (0·137); tarsus 0·395 (0·104) mm.

*Material &c.*—Dr. Meinert collected from 20/vi.–1/ix., 1891, numerous specimens (5 ♂, 10 ♀) of this pretty species in Venezuela, where it seems to live under the bark of trees; Dr. Meinert at least mentions localities where they have been collected under bark, while it is not found amongst the numerous specimens which were captured by sifting. A single male carried a small worm in its large chela. Balzan's specimens are from Petare and Caracas.

*Remarks*.—This species is well characterised by its colour and deep chela.

25. CHELIFER ALBOMACULATUS Balz. (Plate XXX. fig. 16 *a*; text-fig. 67.)

1891. *Trachychernes albomaculatus* Balzan, (11) pp. 526–527, pl. 10. fig. 17.

*Male.*

*Cephalothorax*.—*Ocular* spots very indistinct. The cephalothorax, which is distinctly wider behind than it is long, has two fairly distinct transverse *grooves*, of which the anterior is curved backwards and the posterior forwards in the middle. The integument all over is strongly and coarsely granular with rounded or pointed granules, and provided with moderately long, distinctly clavate hairs.

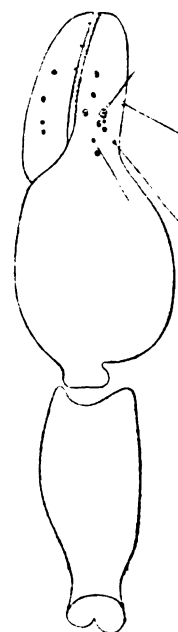
*Abdomen*.—The abdomen, which is only a little longer than wide, is flattened and of

a very shining appearance; the tergites are longitudinally divided with the exception of the eleventh. All the tergites are strongly granular all over, and have along the posterior margin about 12 long, strongly clavate *hairs* in addition to two lateral ones, but they have scarcely any median hairs in front of the row. The "tactile" hairs of the eleventh tergite are missing in the specimens examined.

*Antennæ*.—The terminal hair extends in a very high degree beyond the short *galea*, which is rather clumsy, somewhat attenuated, with three short terminal teeth.

*Palps* (Pl. XXX. fig. 16 a; text-fig. 67).—The *maxillæ* are granular, most distinctly laterally; the palps are distinctly granular above with the exception of the hand; the ventral side is less distinctly granular and the fingers are smooth. The *hairs* of the femur and the trochanter, especially anteriorly, are long, strongly clavate, somewhat curved, and directed forwards; the hairs of the two following joints increase in length and slenderness towards the fingers, in which the pointed hairs are completely simple or provided with one or several median teeth. The *trochanter*, which is 1.5 as long as wide, is strongly convex anteriorly, but posteriorly slightly produced ventrally; dorsally it is produced into a fairly high rounded protuberance. The *femur* has a fairly long and well-defined stalk, beyond which it is widened out to a point somewhat behind the tip and then is a little attenuated. It is 2.7 as long as wide; the anterior outline is very slightly convex and then concave, while the posterior is gradually and moderately convex beyond the stalk and then with a moderate concavity or even incision, distally passing into a slightly marked convexity, which is again terminally followed by a concavity. The *tibia*, which has a long and fairly well-marked stalk, is almost as long as the femur, but distinctly wider and 2.2 as long as wide; anteriorly, beyond the stalk, it is fairly distinctly convex and terminally slightly concave, while the posterior outline beyond the fairly pronounced condylus is almost straight and then slightly convex. The *chela*, which is about 2.5 as long as wide, is 1.3 wider than the trochanter is long; the *hand*, which is almost as long as but 1.4 wider than tibia, is almost 1.5 longer than both wide and deep, a trifle wider than deep, and 1.4 as long as fingers, which are a little longer than hand is broad; the lateral outlines as well as the ventral are moderately convex, while the dorsal one is very distinctly convex. The fingers gape a trifle when closed, and each bears anteriorly two or three *accessory* teeth. Posteriorly each finger has about eight *accessory* teeth. The number of the "*spots*" and the arrangement are a little variable in the specimen, but the arrangement in the main is the same as that in the figures; anteriorly the immovable finger has a single "spot" behind the basal hair, four beyond and behind the median hair, and three in

Text-fig. 67.



*Ch. albomaculatus*  
Balz., ♂. Chela and  
tibia of right palp in  
anterior view.  $\times 44$ .



the middle along the lower margin; while the movable finger has four in a longitudinal row; posteriorly, the movable finger has about four in the middle, and the immovable four basally and a single median one more apart.

*Coxæ*.—The coxæ are very similar to those of *Ch. bicolor* Balz., but the second pair are less restricted basally, and the fourth pair are scarcely widened out towards the end.

*Legs*.—The proximal joints are granular. The hairs of the dorsal side are long and distinctly clavate in the fourth pair of legs, moderately so in the first pair; the hairs of the lower surface are pointed and simple or almost so; a rather short tarsal "tactile" hair  $\frac{4}{5}$  removed from the base is found. The legs are fairly long and slender; the trochantin of the first pair is distinctly deeper than the femur proper and the tibia is a trifle shorter than the *tarsus*, which is 4.6 as long as deep. The *femur* of the fourth pair of legs, which is 2.9 as long as deep, is 1.1 as long as the tibia, and 2 lower than the tarsus long.

*Colour*.—The palps are dark brown with the stalk and the extremities lighter, and so is the cephalothorax, except two white spots on the second tergite laterally. The abdomen is dark brown with the exception of a broad longitudinal band, which is widest in the median segments, and consequently appears to be somewhat zigzag, and a spot on each half of a tergite; the colour of the band and the spots is white or yellowish.

*Measurements*.—Cephalothorax 0.851 (0.920); abdomen 1.265 (1.150) mm.

Palps: trochanter 0.368 (0.253); femur 0.745 (0.276); tibia 0.736 (0.335); hand 0.713 (0.483), depth 0.460; finger 0.506 mm.

Leg I.: femur 0.464 (0.148), trochantin 0.114 (0.160); tibia 0.334 (0.106); tarsus 0.350 (0.076) mm.

Leg IV.: femur 0.593 (0.205); tibia 0.517 (0.129); tarsus 0.410 (0.095) mm.

#### *Female.*

*Antennæ*.—The *galea* extends beyond the terminal hair, and possesses three pairs of distal short branches.

*Palps*.—The proximal joints scarcely differ; the *hand* is comparatively wider, namely 1.5 wider than the tibia; it is 1.6 longer than deep, and wider than the fingers are long. The "spots" in the main are arranged as in the male, the most important difference being that the movable finger has only three "spots" anteriorly; in one specimen I found two spots behind the basal hair anteriorly.

*Legs*.—The legs are perhaps a little more slender, the *tarsus* of the first pair of legs being, for instance, 4.9 as long as deep and the *femur* of the fourth pair 3.1.

*Measurements*.—Cephalothorax 0.920 (1.104); abdomen 1.840 (1.610) mm.

Palps: trochanter 0.460 (0.310); femur 0.897 (0.330); tibia 0.897 (0.400); hand 0.897 (0.598), depth 0.552; finger 0.575 mm.

Leg I.: femur 0.532 (0.160), trochantin 0.122 (0.178); tibia 0.403 (0.114); tarsus 0.410 (0.084) mm.

Leg IV.: femur 0.714 (0.228); tibia 0.631 (0.137); tarsus 0.471 (0.108) mm.

*Variation*.—A female from La Guayra differed from the described specimen by its smaller size, its less slender palps and legs, and by the colour of the abdomen, which had the longitudinal band of equal breadth throughout and the lateral spot better pronounced.

*Material &c.*—Of this species I have examined two males, six females (of which one carried a bundle of eggs), and two young animals from New Granada (Keyserling Coll.). In addition to the above-mentioned badly-preserved specimens, I have had at my disposal a female collected by Dr. Meinert in the month of July on a road, La Guayra. Balzan's specimens are from Venezuela.

*Remarks*.—The described specimens differ in a slight degree from Balzan's description by the colour and the proportion of the joints of the palps. It is easily distinguished from *Ch. bicolor* Balz. by the shape of the femur of the palps with its strongly clavate hairs, and by its colour.

26. CHELIFER CRASSIMANUS Balz. (Plate XXX. figs. 17 *a-b*; text-figs. 68 & 69.)

1890. Balzan, (10) pp. 421–423, tav. xiv. figs. 8–8 c.

1891. *Trachychernes crassimanus* Balzan, (11) p. 548.

1905. Ellingsen, (18) pp. 13–15.

1907. Tullgren, (23) pp. 71–72.

*Cephalothorax*.—Fairly distinct *ocular* spots or perhaps real eyes, as they show traces of a curved lens. The cephalothorax, which is distinctly longer than wide, has two prominent, deep, almost straight, transverse *grooves*. The integument of the head, the first thoracic tergite, and the black spot in the middle of the second are distinctly and coarsely granular, and provided with rather short and moderately clavate hairs, somewhat inclined.

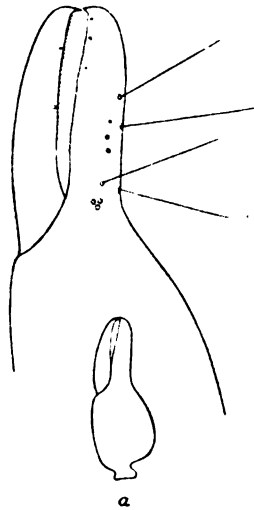
*Abdomen* (Pl. XXX. fig. 17 *a*).—The fairly long and slender abdomen has all the tergites, with the exception of the hindmost part of the eleventh, divided by a broad longitudinal band. All the tergites are distinctly granular, and the median bear from 12–16 fairly long and moderately clavate *hairs* (fig. 17 *a*) along the hindmost margin, in addition to two lateral and two median hairs most distinctly in front of the row. The eleventh tergite bears a pair of short “tactile” hairs.

*Antennæ*.—The *galea* extends beyond the terminal hair, and bears about eight short distal branches.

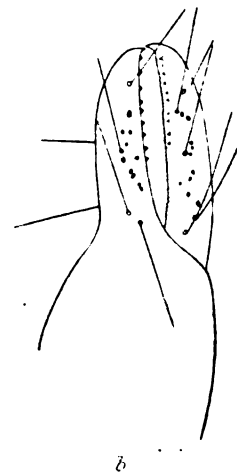
*Palps* (Pl. XXX. fig. 17 *b*; text-figs. 68 & 69).—The *maxillæ* are slightly granular in the middle and behind, but very distinctly so laterally and in front; the palps are distinctly and coarsely granular all over, with the exception of the almost smooth fingers. The palps bear many rather short or moderately long *hairs*, which are

moderately clavate on the femur and slightly clavate or obtuse on the two following joints; those of the fingers are not very long, pointed, and generally broken, with one or a few median teeth. The *trochanter*, which is 1·5 as long as broad, is anteriorly moderately convex, but posteriorly moderately produced and dorsally prolonged into a fairly deep and well-marked, somewhat conical eminence. The *femur* has a fairly

Text-fig. 68.



Text-fig. 69.



*Ch. crassimanus* Balz., ♀.—Chela of right palp in anterior (a) and posterior (b) view.  $\times 44$ .

long and well-marked stalk, beyond which it is widened out to a point somewhat behind the tip and then is in a slight degree attenuated. It is about 2·5 as long as wide; the anterior outline is very slightly convex and then concave, while the posterior is rather suddenly convex just beyond the stalk, almost straight in the middle and slightly convex distally. The *tibia*, which has a moderately short and well-marked stalk, is a little longer, but distinctly wider than the femur, and 2·2 as long as wide; anteriorly, beyond the stalk, it is distinctly convex and then slightly concave, while the posterior outline, beyond the small condylus and insignificant basal elevation, is almost straight and then moderately convex. The *chela*, which is 2·8 as long as wide, is only 1·1 broader than the trochanter is long; the *hand*, which is as long as, but 1·4 wider than the tibia, is 1·5 as long as wide, a trifle deeper than wide, and scarcely 1·2 as long as the fingers, which are much longer than hand is deep and do not gape when closed; the lateral outlines are distinctly convex, and so is the dorsal, the latter is basally more suddenly produced, while the ventral side is only slightly convex. The fingers bear three or two *accessory* teeth anteriorly, and about ten posteriorly. The immovable finger has three *spots* anteriorly behind the basal hairs and three in a longitudinal row beyond, and the movable finger has none, while

posteriorly the immovable finger has ten spots and the movable about twelve in the middle.

*Coxæ*.—The coxæ are almost the same as in *Ch. bicolor* Balz., the only difference being that the third pair have the anterior and inner corner produced into a short blunt process (*cf.* fig. 15 *e*).

*Legs*.—The proximal joints are granular. The hairs of the dorsal surface are moderately long and slightly clavate or obtuse, those of the ventral side are generally pointed and simple, seldom dentated and obtuse. A tarsal “*tactile*” hair, a little longer than its distance to the tip and three-fourths removed from the base, is found. The legs are fairly long and slender; the trochantin of the first pair is much deeper than the femur proper; the tibia is of almost equal length with the *tarsus*, which is five times as long as deep. The *femur* of the fourth pair of legs is almost three times as long as deep, 1.1 as long as tibia, and about 2.2 lower than the tarsus is long.

*Colour*.—The palps are dark brown and so is the cephalothorax, with the exception of the second tergite, which only has a small triangular black spot in the middle. The abdominal tergites are light brown with the longitudinal band and a spot on each side yellowish.

*Measurements*.—Cephalothorax 0.920 (0.805); abdomen 2.070 (1.380) mm.

Palps: trochanter 0.483 (0.322); femur 0.805 (0.345); tibia 0.828 (0.391); hand 0.828 (0.552), depth 0.565; finger 0.713.

Leg I.: femur 0.578 (0.175), trochantin 0.122 (0.195); tibia 0.433 (0.114); tarsus 0.426 (0.084) mm.

Leg IV.: femur 0.707 (0.243); tibia 0.646 (0.140); tarsus 0.517 (0.095) mm.

*Variation*.—The other specimen which was examined only differed by the number and arrangement of the “*spots*”; anteriorly the immovable finger has either one or two “*spots*” behind the basal hairs, and two behind and one beyond the terminal hair; posteriorly the most important differences are that the immovable finger has only two “*spots*” beyond the median hair, and that the movable seems only to possess five spots.

*Material*.—Dr. Meinert obtained two females by sifting in the month of August, at La Moka. This species had previously been collected in Paraguay and Brazil (Matto Grosso).

*Remarks*.—It is with the greatest hesitation that I have referred the above-described form to *Ch. crassimanus* Balz., as the hand is only 1.4 instead of 1.6 as wide as the tibia, and 1.2 instead of 1.4 longer than the fingers; from Ellingsen’s description it differs besides by the maxillæ, which are not smooth, and by the tibia, which is not nearly smooth below. The only one of the mentioned characters which would justify the establishment of a new species is the longer fingers; but as the fingers of the male are only a little shorter than the hand, I think it better not to establish a new species. From the two preceding species, *Ch. crassimanus* Balz. differs by shape of the femur and its hairs as well as by its colour.



27. CHELIFER MEINERTII, sp. n. (Plate XXX. figs. 18 *a-g*.)*Female.*

*Cephalothorax*.—Two rather indistinct *ocular* spots. The cephalothorax, which is as long as broad, has a peculiar shape, as it is almost of equal breadth behind the median groove, but in front distinctly attenuated towards the front margin; two fairly prominent and deep, almost straight transverse *grooves* are found. The integument is strongly *granular*, with prominent, either rounded or conically pointed granules everywhere except on the two white spots of the second thoracic tergite, and it is provided with a number of short, fairly distinctly clavate hairs.

*Abdomen* (Pl. XXX. figs. 18 *a-b, g*).—The abdomen is obovate in shape, and is, in this female, which is distended with eggs, almost as wide as long. The distance between the seventh and eighth sclerites, for instance, is, in this specimen, longer than the sclerites, and the distance between the two lateral parts only slightly narrower than each half. All the tergites except the last are longitudinally divided by a broad band; their sclerites are distinctly granular. The hairs, which anteriorly are short and distinctly clavate, but posteriorly longer and only moderately so (figs. 18 *a-b*), are found on the median tergites numbering 10–12 along the hindmost margin; the median pair of these hairs, which are placed outside the dark portion of the tergite, are set scarcely in front of the row in contradistinction to a lateral hair on each side. The eleventh tergite has a pair of rather short “tactile” hairs. The hairy spot in front of the genital opening is triangular in shape (fig. 18 *g*).

*Antennæ* (Pl. XXX. fig. 18 *c*).—The *galea*, which has about six short distal branches, extends scarcely beyond the terminal hair (fig. 18 *c*).

*Palps* (Pl. XXX. figs. 18 *d-f*).—The *maxillæ* are smooth in the middle, but laterally, anteriorly, and even interiorly distinctly granular; the palps, with the exception of parts of fingers, are distinctly and coarsely granular. The palps bear a number of more or less short *hairs*, which on the trochanter and the femur are strongly clavate, while the two following joints bear more or less distinctly clavate or obtuse hairs; those of the fingers are generally short, pointed, and broken, with a single or a few median teeth. The *trochanter*, which is about 1·3 as long as wide, is moderately convex anteriorly, but posteriorly it is rather suddenly produced, dorsally only slightly so. The *femur* has a rather short well-defined stalk, beyond which it is of almost equal breadth throughout (broadest in the middle). It is 2·4 as long as wide; the anterior outline is a trifle convex and then concave, while the posterior, beyond the rather sudden basal convexity, is almost straight and then a trifle convex. The *tibia*, which has a rather short and well-marked stalk, is as long as and a little wider than the femur, and twice as long as broad; anteriorly, beyond the stalk, it is suddenly and distinctly convex and then slightly concave, while the posterior outline, beyond the small condylus and insignificant basal elevation, is almost straight and then moderately convex. The *chela*, which is 2·5 as long as wide, is 1·3 as broad as the

trochanter is long; the *hand*, which is a little longer, but 1.5 wider than the tibia, is 1.4 as long as wide, a little deeper than wide and 1.3 as long as fingers, which are a little longer than hand deep, and do not gape when closed; the lateral outline, as well as the dorsal which is more suddenly produced, is distinctly convex, while the ventral is only slightly so. Both fingers bear anteriorly two distal *accessory* teeth (*cf.* fig. 18 *e*), while the immovable finger has posteriorly 9 teeth and the movable as many as 12, placed from near the base to almost the tip (*cf.* fig. 18 *f*). The immovable finger possesses anteriorly three "*spots*" behind the basal hair, six in the area between the four "*tactile*" hairs, and four in a longitudinal row near to the lower margin, while the movable finger has about eight in a longitudinal row from the base to near tip (fig. 18 *e*); posteriorly the immovable finger has about ten and the movable eight "*spots*" arranged as shown in fig. 18 *f*.

*Coxæ* (Pl. XXX. fig. 18 *g*).—The *coxæ* are very similar to those of *Ch. bicolor* Balz. (*cf.* fig. 15 *e*), the only difference being that the third pair are basally restricted, and that these, as well as the second pair, show traces of an anterior blunt basal process: the fourth pair are besides more slender.

*Legs*.—The proximal joints are only very indistinctly granular. The hairs of the dorsal surface are moderately long, and distinctly clavate in the fourth pair of legs, but slightly clavate or obtuse in the first pair, while those of the ventral surface are pointed and more or less simple. The tarsal "*tactile*" hair, which is distinctly longer than the distance to the tip, is three-fourths removed from the base. The legs are fairly long and slender; the trochantin of the first pair is much deeper than the femur proper; the tibia is a little shorter than the *tarsus*, which is 4.5 as long as deep. The *femur* of the fourth pair of legs is 2.7 as long as deep, 1.1 longer than the tibia, and almost 1.9 lower than tarsus long.

*Colour*.—The three proximal joints of the palps are yellowish brown with the basal and terminal part lighter; the chelæ are dark brown, and so is the cephalothorax with the exception of two white spots, which in the middle are separated by a median quadrangular dark spot and laterally bounded by a narrow dark stripe. The tergal sclerites of the abdomen are brownish, and the membranes between are yellowish.

*Measurements*.—Cephalothorax 0.690 (0.690); abdomen 1.725 (1.495) mm.

Palps: trochanter 0.335 (0.207); femur 0.598 (0.253); tibia 0.598 (0.285); hand 0.621 (0.437), depth 0.437; finger 0.495 mm.

Leg I.: femur 0.395 (0.132), trochantin 0.084 (0.140); tibia 0.296 (0.091); tarsus 0.312 (0.068) mm.

Leg IV.: femur 0.532 (0.200); tibia 0.479 (0.114); tarsus 0.372 (0.080) mm.

*Material*.—Of this pretty species I have examined a single female, collected by Dr. Meinert in the month of January on a road "Old la Guayra (Caracas)"; I have named this species after Dr. Meinert, who collected such a number of these animals in Venezuela.

*Remarks.*—The described species is in most respects very similar to the preceding, but it seems, nevertheless, as far as can be judged with only a single specimen at one's disposal, to be well characterised by the shorter and more distinctly clavate hairs especially of the femur, by the shorter finger, by the longitudinal row of spots anteriorly on the movable finger, and by the second thoracic tergite, which has two white spots. From *Ch. bicolor* Balz. and *Ch. albomaculatus* Balz. it differs in colour and in the shape of the femur and hairs.

28. CHELIFER SUBROTUNDATUS Balz. (Plate XXX. figs. 19 *a-c*.)

1891. *Trachychernes subrotundatus* Balzan, (11) pp. 522–523, pl. 10. figs. 14–14 *a*.

*Female.*

*Cephalothorax.*—*Ocular* spots almost obsolete. The cephalothorax, which is of almost equal length and width, is provided with two transverse *grooves*, of which the anterior is fairly prominent and slightly curved backwards in the middle, while the posterior is indistinct. The integument is distinctly and coarsely granular, except on the two large white spots of the second tergite, and is provided with short obtuse hairs.

*Abdomen.*—The abdomen is fairly long and slender, and has all its tergites except the eleventh longitudinally divided by a broad band. The sclerites are granular, and the tergites bear 8–10 *hairs* along the hindmost margin as well as a lateral hair on each side, but there is no median hair in front of the row; the hairs are slender, fairly long or long, obtuse or even slightly clavate. The eleventh tergite has a pair of rather short tactile hairs. The abdomen has behind the first pair of sclerites and in front of the vulva an area with about 30 short hairs placed close together.

*Antennæ.*—The short *galea*, which has only about six distal teeth, scarcely extends beyond the terminal hair.

*Palps* (Pl. XXX. figs. 19 *a-c*).—The *maxillæ* are smooth in the middle and granular laterally; the palps are fairly distinctly granular, but the lower side, the hand, and of course the fingers are less distinctly so, and are, indeed, more or less smooth. The fairly long hairs are obtuse in the trochanter and femur, but pointed and dentated on the hand. The *trochanter*, which is 1.5 as long as wide, is moderately convex anteriorly, but posteriorly is scarcely produced below, and dorsally has a very low rounded protuberance. The *femur* has a short and well-defined stalk, beyond which it is somewhat widened out and then in a slight degree attenuated. It is 2.2 as long as wide; the anterior outline is slightly convex and then concave, while the posterior, beyond the not very sudden basal convexity, is almost straight and then a trifle convex. The *tibia*, which has a short well-marked stalk, is almost as long as and somewhat broader than the femur, and twice as long as wide; anteriorly, beyond the stalk, it is strongly convex and then slightly concave, while the posterior outline beyond the prominent condylus and insignificant basal elevation is at first almost

straight and then moderately convex. The *chela*, which is about 2·7 as long as wide, is almost 1·3 as broad as the trochanter is long; the *hand*, which is somewhat longer and scarcely 1·5 wider, is 1·6 as long as wide, a little wider than deep, and 1·4 as long as the fingers, which are distinctly longer than the hand is wide and do not gape when closed; the lateral outlines are moderately convex, while the dorsal outline beyond the stalk is at first abruptly convex and then slightly so. The immovable finger bears anteriorly, as well as posteriorly, three accessory teeth, while the movable finger has two only. The number of "spots" is small, for the immovable finger has only four and three, anteriorly and posteriorly respectively, while the movable finger has only a single one on each side; they are arranged as shown in figures (figs. 19 *b-c*).

*Coxæ*.—The second and the third pair are very similar to those of *Ch. bicolor* Balz. (*cf.* fig. 15 *e*), but seem to be comparatively shorter; the fourth pair have the comparatively shorter inner margin merging into the hinder without any limitation, and are slightly widened out towards the extremity.

*Legs*.—The proximal joints are only indistinctly granular. The fairly long hairs are dorsally slightly clavate, obtuse or dentated, and ventrally pointed and more or less simple; the tarsal "tactile" hair is two-thirds removed from, and much longer than distance to, tip. The legs are moderately long and slender; the trochantin of the first pair is scarcely deeper than the femur proper, and its tibia scarcely as long as the *tarsus*, which is 3·9 as long as deep. The *femur* of the fourth pair is 2·5 as long as deep, almost 2·2 as long as the tibia, and 1·7 lower than the *tarsus* is long.

*Colour*.—Palps are reddish brown; cephalothorax dark brown, with the exception of the yellow second tergite, which has a quadrangular black spot in the middle. Tergal sclerites brown.

*Measurements*.—Cephalothorax 0·621 (0·600); abdomen 1·610 (1·081) mm.

Palps: trochanter 0·276 (0·184); femur 0·481 (0·227); tibia 0·483 (0·240); hand 0·552 (0·345), depth 0·335; finger 0·375 mm.

Leg I.: femur 0·312 (0·122), trochantin 0·076 (0·122); tibia 0·228 (0·085); tarsus 0·236 (0·061) mm.

Leg IV.: femur 0·410 (0·167); tibia 0·350 (0·106); tarsus 0·281 (0·072) mm.

*Material*.—Of this species I have examined a single female, collected by Dr. Meinert on a road in the month of July, La Guayra (Caracas). Balzan's specimens are also from Venezuela.

*Remarks*.—That the animal described really belongs to *Ch. subrotundatus* is somewhat doubtful, as the latter has the cephalothorax longer than wide, the femur of the palps only twice as long as wide, a prominent basal elevation on the tibia posteriorly, and the hand basally much more abruptly convex, especially anteriorly; the two last-mentioned structures may perhaps be explained by the fact that the chela has not been figured in a true dorsal view, and that they have been somewhat exaggerated by the artist as well as the engraver.



## 29. CHELIFER PLUMOSUS, sp. n. (Plate XXX. figs. 20 a-e.)

*Female.*

*Cephalothorax*.—Large rather indistinct *ocular* spots. The cephalothorax, which is a little longer than wide, has two prominent, almost straight, transverse *grooves*. The integument of the head and first thoracic tergite as well as of the small black spot on the second tergite is strongly granular all over with rounded or pointed granules and is provided with short distinctly clavate hairs.

*Abdomen* (Pl. XXX. fig. 20 e).—The fairly long and slender abdomen has all the tergites with the exception of the eleventh longitudinally divided by a broad band. The sclerites, which on the first tergite are represented by a mere transverse line, are distinctly granular. From 12–14 distinctly clavate *hairs*, short in front and fairly long behind, are placed along the hindmost margin of each tergite, which possesses besides a median hair, placed within the longitudinal band, slightly in front of the row, and a lateral one distinctly so placed, at least in the median segments. The eleventh tergite as well as the corresponding sternite bears a pair of “tactile” hairs. The hairy spot in front of the vulva is rather small and insignificant (fig. 20 e).

*Antennæ*.—The rather short *galea* extends a trifle beyond the terminal hair and has six rather short distal branches, decreasing towards the end.

*Palps* (Pl. XXX. figs. 20 a-c).—The *maxillæ* are smooth in the middle, laterally granular; the palps are very distinctly granular with the exception of the more or less indistinctly granular lower surface and completely smooth fingers. The short *hairs* of the three proximal joints are anteriorly more or less distinctly clavate, but posteriorly obtuse or dentated, sometimes similar to those of the hand; these, which are so numerous that the hand appears somewhat shaggy, are slightly curved with the end directed forwards, or, more correctly, the distal half makes an obtuse or even a right angle with the proximal; the basal portion is without any teeth, while the distal has about ten short teeth and consequently has a somewhat plumose appearance (fig. 20 d). The *trochanter*, which is 1.5 as long as wide, is anteriorly moderately convex and posteriorly fairly distinctly produced, but very slightly so dorsally. The *femur* has a short and distinct stalk, beyond which it is of almost equal breadth throughout, but for the slightly attenuated terminal part. It is 2.3 as long as wide; the anterior outline, beyond the stalk, is very slightly convex and then concave, while the posterior is rather suddenly convex and then almost straight. The *tibia*, which has a moderately long and well-marked stalk, is a little longer and broader than the femur and 2.2 as long as wide; anteriorly it is, beyond the stalk, moderately convex and terminally a trifle concave, while the posterior outline, beyond the fairly big condylus, is at first almost straight and then moderately convex. The *chela*, which is 2.4 as long as wide, is 1.4 as broad as the trochanter is long; the *hand*, which is of almost equal length to and 1.6 wider than the tibia, is 1.4 as long as wide, scarcely

1.1 as deep as wide, and 1.5 as long as the fingers, which are a trifle shorter than the hand is broad and scarcely gape when closed; the lateral outlines of the hand are distinctly convex, and so is the dorsal, which is, however, more suddenly raised beyond the stalk, while the ventral is only slightly convex. The fingers bear anteriorly only two accessory teeth each, while the number posteriorly is about ten. Anteriorly the immovable finger has basally between the tactile hairs about four "spots" and farther down three much smaller ones, while the movable finger has seven in a longitudinal row from near the base to near the end; posteriorly the immovable finger has eight "spots" in two groups and the movable finger has seven spots (*cf.* figs. 20 *b-c*).

*Coxæ* (Pl. XXX. fig. 20 *e*).—The third and the second pair are similar to those of *Ch. bicolor* Balz., the latter being distinctly narrower at the base; the fourth pair are rather peculiarly shaped, being slightly pointed interiorly and in the front, and scarcely widened out towards the extremity, with the inner margin, which is the shorter, distinctly merging into the hinder.

*Legs*.—The proximal joints are very slightly granular. The rather short hairs are either moderately or slightly clavate, or obtuse, dorsally, in the fourth and first pair of legs respectively; those of the ventral side are pointed and more or less simple; a tarsal "tactile" hair, much longer than the distance to the tip, is two-thirds removed from the base. The legs are not very slender and the trochantin of the first pair is deeper than the femur proper, while its tibia is a trifle longer than the *tarsus*, which is almost four times as long as deep. The *femur* of the fourth pair is about 2.3 as long as deep, scarcely 1.1 as long as the tibia, and 1.6 lower than the *tarsus* is long.

*Colour*.—The palps are light brown with the chela much darker; the head, first tergite, and a tiny median spot of the second tergite are light brown, darker than the proximal joints of the palps; the dorsal side of the abdomen has brown sclerites and the skin between white; the white transverse band in the middle of the body encompasses almost the whole second thoracic tergite and the first abdominal with the exception of a transverse darker line.

*Measurements*.—Cephalothorax 0.647 (0.621); abdomen 1.265 (0.828) mm.

Palps: trochanter 0.276 (0.184); femur 0.506 (0.217); tibia 0.515 (0.230); hand 0.529 (0.375), depth 0.400; finger 0.368 mm.

Leg I.: femur 0.327 (0.125), trochantin 0.070 (0.133); tibia 0.251 (0.084); tarsus 0.236 (0.061) mm.

Leg IV.: femur 0.418 (0.182); tibia 0.388 (0.106); tarsus 0.288 (0.068) mm.

*Material*.—Of this beautiful little species I have examined a single female sifted in the month of August by Dr. Meinert, at La Moka.

*Remarks*.—The described species, which may be easily distinguished from all other species of this group by the singular feathery hairs of the hand, is probably nearly related to *Ch. subrotundatus* Balz. In the shape of the hairs of the hand it has some similarity to *Ch. armiger* Balz., but in other respects scarcely any.

## 30. CHELIFER NITIDIMANUS Ell. (Plate XXX. fig. 21 a; text-fig. 70.)

1905. Ellingsen, (18) pp. 11-12.

*Female.*

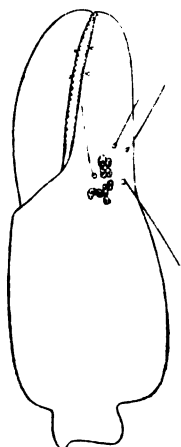
*Cephalothorax*.—Large rather indistinct *ocular* spots (*cf.* Ellingsen, 18.). The *cephalothorax*, which is distinctly longer than wide, has two distinct transverse *stripes*, which are slightly curved backwards in the middle. The integument is fairly distinctly granular with rather flat granules, with the exception of the almost smooth lateral white spots of the second tergite; the short hairs are slightly clavate.

*Abdomen*.—The fairly long and slender abdomen has all the tergites except the eleventh divided by a distinct longitudinal band. The sclerites are granular with scale-shaped granules, and bear along the hindmost margin of each pair six or eight fairly long slightly clavate *hairs* as well as a lateral one in front of the row (*cf.* Ellingsen); the eleventh tergite possesses a pair of "tactile" hairs. The hairy spot in front of the vulva is very insignificant.

*Antennæ*.—The fairly slender *galea*, which has at least six distal branches, extends slightly beyond the terminal hair. The *flagellum* consists of three hairs.

*Palps* (Pl. XXX. fig. 21 a; text-fig. 70).—The *maxillæ* are completely smooth; the trochanter and femur are distinctly granular and so is the tibia, but less distinctly;

Text-fig. 70.



*Ch. nitidimanus* Ell.,  
♀. Chela of right  
palp in anterior view.  
× 77.

all these joints are smooth below, and so is the hand all over except anteriorly at the base of the fingers (*cf.* Ellingsen). The long hairs are either slightly clavate, as on the inner surface of the femur, or obtuse and dentated. The *trochanter*, which is about 1.6 as long as wide, is anteriorly moderately convex and posteriorly as well as dorsally slightly produced. The *femur* has a short and well-marked stalk, beyond which it is of almost equal breadth throughout, only very slightly attenuated towards the end. It is about 2.2 as long as wide; the anterior outline is very slightly convex and then a trifle concave, while the posterior is rather abruptly convex beyond the stalk, then straight and again terminally a trifle convex. The *tibia*, which has a moderately long and well-marked stalk, is a little longer and wider than the femur and about twice as long as broad; the anterior outline is fairly distinctly convex with a slight terminal concavity, while the posterior, beyond the moderately big condylus, is basally straight and then regularly and moderately convex with the most raised part

a little beyond the middle. The *chela*, which is three times as long as wide, is almost 1.2 as broad as the trochanter is long; the *hand*, which is scarcely longer than the tibia, but 1.4 as wide, is almost 1.7 longer than broad, about 1.1 as deep as wide, and about 1.2 as long as the fingers, which are distinctly longer than the hand is deep and do not gape when closed; the lateral as well as the dorsal outlines of the hand

are moderately convex, while the ventral is almost straight. Both fingers possess anteriorly two *accessory* teeth near to the end, and posteriorly a few distally. The immovable finger is anteriorly adorned with about nine basal "*spots*" densely crowded (*cf.* text-fig. 70) and has posteriorly three between the three basally placed tactile hairs; while the movable has only two spots, placed basally.

*Coxæ*.—The second pair are only slightly narrower at the base; the fourth, trapezoidal pair, are much longer than wide, scarcely widened out towards the extremity, the inner margin is fairly well distinguished from the slightly concave and much longer hinder margin.

*Legs*.—The proximal joints are slightly granular. The fairly long hairs are slightly clavate or obtuse dorsally; those of the ventral side are pointed; the tarsal "*tactile*" hair, which is as long as its distance from the tip, is two-thirds removed from the base. The hairs are moderately long and slender, and the trochantin of the first pair of legs is scarcely deeper than the distal femoral part, while its tibia is as long as the *tarsus*, which is 3·7 as long as deep. The *femur* of the fourth pair of legs is 2·2 as long as deep, 1·2 as long as the tibia, and 1·6 lower than the *tarsus* is long.

*Colour*.—The palps, the head, and first thoracic tergite as well as a semicircular spot of the second, and the tergal sclerites are yellowish brown, while the rest of the thoracic tergite and the interstitial parts are yellowish or white.

*Measurements*.—Cephalothorax 0·529 (0·437); abdomen 1·150 (0·690) mm.

Palps: trochanter 0·228 (0·137); femur 0·395 (0·179); tibia 0·410 (0·190); hand 0·438 (0·266), depth 0·296; finger 0·360 mm.

Leg I.: femur 0·251 (0·106), trochantin 0·053 (0·106); tibia 0·182 (0·072); tarsus 0·182 (0·049) mm.

Leg IV.: femur 0·319 (0·144); tibia 0·274 (0·084); tarsus 0·228 (0·061) mm.

*Material*.—E. Simon collected a single female in St. Vincent, whilst Ellingsen's specimen was from Pará.

*Remarks*.—I have referred this specimen to *Ch. nitidimanus* Ell., in spite of its small size, lighter colour, less strongly convex outlines of tibia and hand, and shorter fingers. By its smooth hand it is distinguished from at least most South-American species.

### 31. CHELIFER MICHAELSENI Sim. (Plate XXX. figs. 22 *a-c*.)

1902. E. Simon, (14) p. 44.

1904. E. Ellingsen, (16) pp. 4–5.

*Cephalothorax*.—*Ocular* spots (?) rather indistinct; as their chitin is transparent, without granulation and slightly convex, they may perhaps be designated real eyes. The cephalothorax, which is somewhat longer than wide, has two transverse *grooves*, a wide and shallow anterior one almost straight and very prominent, and a posterior distinctly curved forwards in the middle and less prominent. The integument is



distinctly granular on the head and first tergite, but less distinctly so on the second tergite and is provided with short obtuse hairs.

*Abdomen*.—The fairly long slender abdomen has apparently all tergites except the first and eleventh longitudinally divided. The sclerites are indistinctly granular, and about ten rather short and slightly clavate *hairs* are placed along the hinder margin of each tergite in addition to two lateral ones in front of the row. No "tactile" hair was observed in the eleventh segment in this badly preserved specimen. The sexual area is very prominent, with the anterior genital plate, which has its prominent hinder margin concave, longer than the posterior; chitinous apparatus as well as the accessory glands, visible through the transparent skin, very similar to those of *Ch. cimicoides* F.

*Antennæ*.—The rather short *galea* scarcely extends beyond the terminal hair and has about six short terminal branches.

*Palps* (Pl. XXX. figs. 22 *a-c*).—The *maxillæ* are smooth in the middle, but granular laterally; the three proximal joints are distinctly granular on the anterior surface, but more or less indistinctly so everywhere else; the *hand* seems to be granular only anteriorly and posteriorly, elsewhere being smooth. The fairly long or long hairs are obtuse and dentated or even slightly clavate. The *trochanter*, which is 1.5 as long as wide, is anteriorly moderately convex and posteriorly as well as dorsally slightly produced. The *femur* has a fairly short and well-defined stalk, beyond which it is of almost equal breadth throughout, but for the slightly attenuated terminal part. It is 2.4 as long as wide; anteriorly it is slightly convex and then concave, but posteriorly beyond the not very abrupt basal convexity almost straight and then terminally slightly convex. The *tibia*, which has a moderately long and well-marked stalk, is a little longer and wider than the femur, and 2.2 as long as wide; the anterior outline is moderately convex, while the posterior, beyond the slightly marked condylus and obsolete basal elevation, is almost straight and then slightly convex. The *chela*, which is three times as long as wide, is 1.2 broader than the trochanter is long; the *hand*, which is about as long as, and 1.4 as wide as, the tibia, is 1.6 as long as wide, a trifle wider than deep, and scarcely 1.2 as long as fingers, which are much longer than the hand is wide and gape slightly when closed; the lateral as well as the dorsal outlines are moderately convex, while the ventral is very slightly so. Anteriorly both fingers bear about six *accessory* teeth placed close together just beyond the middle, while the movable finger has four posteriorly and the immovable three; marginal row of teeth complete in both fingers. Anteriorly eight *spots*, placed in two groups (fig. 22 *b*), are found on the immovable finger and only a single one basally on the movable finger, while, posteriorly, the immovable finger is adorned with seven spots and the movable with three only (fig. 22 *c*).

*Coxæ*.—The coxæ are very similar to those of *Ch. celerrimus*, sp. n. (*cf.* below),

but the second pair show traces of a basal narrowing, while the fourth pair are trapezoidal and of almost equal width throughout, with the inner margin much shorter and fairly well separated from the hinder one.

*Legs.*—The proximal joints are almost smooth. Dorsally the fairly long hairs are obtuse or dentated, ventrally pointed, and almost or completely simple. The tarsus of the fourth pair of legs possesses a "tactile" hair two-thirds removed from the base, and behind that, and removed one-third from the base, another large articular cavity; in the specimen examined no terminal "tactile" hair was observed at the tip of the femur and tibia as in *Ch. celerrimus*, sp. n. (*cf.* figs. 23 *d-e*). The legs are long and slender, and the trochantin of the first pair is much deeper than the femur proper, while its *tarsus*, which is 4.6 as long as deep, is 1.1 longer than the tibia; the *femur* of the fourth pair of legs is 2.8 as long as deep, 1.2 as long as tibia, and 2 lower than tarsus is long.

*Colour.*—The palps and the cephalothorax yellowish brown, the latter the lighter, with the chela more reddish brown. The abdomen is very pale, almost white.

*Measurements.*—Cephalothorax 0.759 (0.690); abdomen 1.610 (0.897) mm.

Palps: trochanter 0.345 (0.230); femur 0.647 (0.265); tibia 0.667 (0.299); hand 0.667 (0.414), depth 0.391; finger 0.575 mm.

Leg I.: femur 0.415 (0.129), trochantin 0.091 (0.144); tibia 0.312 (0.091); tarsus 0.342 (0.073) mm.

Leg IV.: femur 0.570 (0.205); tibia 0.464 (0.125); tarsus 0.410 (0.088) mm.

*Material &c.*—Of this species I have examined a single male from Rio Janeiro, collected by the Danish 'Galathea' Expedition; it has previously been recorded from Tierra del Fuego and Patagonia.

*Remarks.*—The specimen examined differs from Ellingsen's description (Simon's description of the typical specimens was not at my disposal) in mere trivialities, viz., ocular spots fairly distinct instead of wanting, second transverse groove convex instead of straight, better-marked granulations, and comparatively longer femur, and consequently it is most naturally referred to the same species. This species bears in the structure of the legs, &c., great similarity to *Ch. celerrimus*, sp. n., but is easily distinguished by the femur, which is scarcely attenuated.

### 32. CHELIFER BREVIFEMORATUS Balz.

1890. Balzan, (10) pp. 420-421, tav. xiv. figs. 7-7 c.

1891. Balzan, (11) p. 548.

1902. Ellingsen, (15) pp. 156-158.

1905. Ellingsen, (19) p. 324.

This species is very nearly related to the following, to which I refer, as I have there enumerated the differences. It has been recorded from Paraguay and Ecuador.

33. CHELIFER CELERRIMUS, sp. n. (Plate XXX. figs. 23 *a-c*, *e*; Plate XXXI. fig. 23 *d*.)

*Cephalothorax*.—No *ocular* spots were observed. The cephalothorax, which is distinctly longer than wide, has a median fairly prominent transverse *groove*, which is slightly curved backwards in the middle; there is no posterior groove. The integument is minutely not very distinctly granular and the short hairs are slightly obtuse.

*Abdomen*.—The fairly long and slender abdomen has all the tergites, with the exception of the first and part of the eleventh, divided longitudinally. The tergites have smooth sclerites, and from 14–16 long, pointed, and terminally dentated hairs along the hindmost margin, in addition to four hairs in front of the row; these hairs increase in length from the base to the end of the abdomen, and from the middle towards the side in each tergite. The eleventh tergite and the corresponding sternite have each two pairs of “tactile” hairs.

*Antennæ*.—The *galea*, which extends somewhat beyond the terminal hair, has in the distal half two diverging branches, bearing respectively one and three branches (somewhat similar to Balzan's figure 7 *a* (10)).

*Palps* (Pl. XXX. figs. 23 *a-c*).—The *maxillæ* are almost smooth beneath; the palps are minutely and very distinctly granulated, the inner surface having the granulations most pronounced, the lower surface being almost smooth. The hairs are fairly long or long, are provided with a few teeth, and are scarcely pointed on the proximal joints, but distinctly pointed and almost simple or completely so on the distal joints. The *trochanter*, which is 1.5 as long as wide, is very slightly convex anteriorly; posteriorly it is slightly produced, and dorsally it is prolonged into a rounded, rather low protuberance. The *femur* has a short well-defined stalk, beyond which it tapers distinctly towards the end. It is about 2.2 as long as wide; the anterior outline is slightly convex and then concave, while the posterior is very abruptly convex beyond the stalk, straight in the middle, and then terminally a trifle convex. The *tibia*, which has a moderately long and well-marked stalk, is a little longer and wider than the femur, and is almost 2.2 as long as wide; the anterior outline is moderately convex with a scarcely marked terminal concavity, while the posterior, beyond the fairly big condylus and small but distinct basal elevation, is first almost straight and then slightly convex. The *chela*, which is three times as long as wide, is scarcely broader than the trochanter is long; the *hand*, which is about as long as the tibia, but 1.3 wider, is 1.6 as long as wide, scarcely deeper than wide, and 1.1 as long as the fingers, which are much longer than hand is deep and scarcely gape when closed; the lateral outlines are moderately convex, while the dorsal and ventral are only slightly so. The fingers each bear anteriorly a single *accessory* tooth, while posteriorly the movable finger has two and the immovable finger three teeth anteriorly. Eight “spots” are found in the basal half of the immovable finger,

while posteriorly the immovable finger has four and the movable only one "spot" (*cf.* figs. 23 *b-c*).

*Coxæ*.—The coxæ are distinctly different from those of *Chelifer bicolor* Balz.; the second and the third pair are both widened out towards the end, especially the latter, as the former is much broader than this at the base and not suddenly narrower; the fourth pair are almost wider basally than distally, quadrangular, with the inner margin well separated from, and shorter than, the hinder one.

*Legs* (Pls. XXX.—XXXI. figs. 23 *d-e*).—The proximal joints are completely smooth; the fairly long or long hairs are pointed and completely simple or almost so; dorsally just behind the tip of the femur a very long and slender hair is observed in the fourth pair of legs; a similar hair, but even longer, is placed exactly in the same position in the tibia. The tarsus IV. has the "tactile" hair placed nearer to the base than to the tip, and it is a little longer than the latter distance (*cf.* fig. 23 *e*); between the "tactile" hair and the base another wide articular cavity is observed (*cf.* above). The legs are very long and slender, and the trochantin of the first pair of legs is much deeper than the femur proper, while its *tarsus*, which is about five times as long as deep, is 1.1 longer than the tibia. The *femur* of the fourth pair of legs is 3.2 as long as deep, 1.1 as long as tibia, and 2.3 lower than the tarsus is long.

*Colour*.—The palps, cephalothorax, and tergal sclerites are light brown, but of somewhat different shades.

*Measurements*.—Cephalothorax 0.552 (0.437); abdomen 1.541 (0.897) mm.

Palps: trochanter 0.266 (0.175); femur 0.410 (0.190); tibia 0.426 (0.198); hand 0.433 (0.266), depth 0.266; finger 0.385 mm.

Leg I.: femur 0.296 (0.084), trochantin 0.076 (0.099); tibia 0.228 (0.068); tarsus 0.251 (0.050) mm.

Leg IV.: femur 0.380 (0.118); tibia 0.342 (0.084); tarsus 0.266 (0.061) mm.

*Material*.—Of this species I have examined a single female with a bundle of eggs, collected by Mr. H. H. Smith in the month of March, in a half-shady place in a mixture of earth and old manure, at Balthazar (Windward), Island of Grenada.

*Remarks*.—This species is, as far as can be judged from Balzan's very imperfect description, in most respects similar to *Ch. brevifemoratus* Balz. (1890, 10. pp. 420–421, tav. xiv. figs. 7–7 *c*); but as it has no trace of ocular spots or second transverse groove, as it has smooth tergal sclerites with long and pointed hair instead of "setole . . . corte, troncate all' apice et dentate," and as the palps are not granular all over, without "peli quasi clavati," and the inner outline of the tibia is moderately, not strongly, convex, I prefer to establish a new species, especially taking into consideration that the above-described form is at least not identical with one from Ecuador with "de poils claviformes," which Ellingsen (15. pp. 156–158) has referred to *Ch. brevifemoratus* Balz. It differs from *Ch. michaelsonii* Sim. by the attenuated femur of the palps.



In this place I shall mention a specimen, probably a young animal, from Bogota (Keyserling Coll.), on account of an abnormality (?) in the number of the tactile hairs of the fingers. The immovable finger had only three "tactile" hairs anteriorly and the movable only three posteriorly (*cf.* fig. 24 *a*, Pl. XXXI.).

34. CHELIFER PATAGONICUS Tullgr.

1900. Tullgren, (13) pp. 155-157, figs. 1-5.

Cephalothorax "finely punctuated," with two transverse *grooves*. Abdomen with slightly clavate hairs. Palps finely reticularly granular, clothed with short simple toothed hairs; *femur* about 3 as long as wide and *tibia* 2·3; the *hand* is 1·4 as wide as the *tibia* and as long as the finger.—Patagonia.

35. CHELIFER ELLINGSENII, sp. n. (Plate XXXI. figs. 25 *a-e*; text-fig. 71.)

*Cephalothorax*.—The *ocular* spots are very indistinct, sometimes even absent. The cephalothorax is distinctly longer than wide, and is provided with two almost straight, broad, transverse *stripes* or grooves, of which the anterior is much more prominent than the posterior. The integument is minutely, but distinctly granular, with pointed granules at least laterally in front of the posterior transverse groove; the hairs are very short and obtuse.

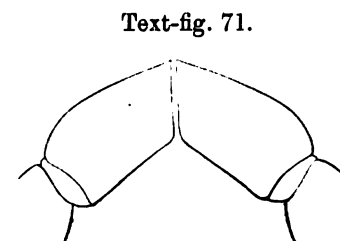
*Abdomen*.—The fairly long, slender abdomen seems to have all the tergites, with the exception of the first and eleventh, longitudinally divided. The sclerites appear almost smooth, and the tergites have along the hindmost margin from 10-14 short, obtuse or slightly clavate *hairs* in addition to four in front of the row on the median segments.

*Antennæ*.—The *galea* is rather short with about six distal branches or teeth, and extends in a slight degree beyond the terminal hair.

*Palps* (Pl. XXXI. figs. 25 *a-c*).—The *maxillæ* are indistinctly granular in the middle, but more distinctly so laterally; the palps are distinctly granular laterally, especially anteriorly, almost smooth dorsally and completely so ventrally. The short or very short hairs are indistinctly pointed, with a median and a terminal tooth. The *trochanter*, which is 1·8 as long as wide, is, anteriorly beyond the stalk, moderately convex, and posteriorly is produced into a rather short round protuberance, which together with the fairly high and better-pronounced one of the dorsal surface gives the posterior surface a bigibbose appearance. The *femur* has a fairly long, not well-defined stalk, beyond which it is gradually and distinctly widened towards the middle and then terminally a little narrower again. It is three times as long as wide; the anterior outline, beyond the stalk, is first very slightly convex and then concave, while the posterior is smoothly and gradually convex basally, but almost smooth in the middle, and beyond a trifle convex again. The *tibia*, which has a very long and slender, but not well-defined stalk, is a little shorter, but wider than the *femur*, and is

2.6 as long as wide; the anterior outline, beyond the stalk, is moderately convex and then terminally a trifle concave, while posteriorly beyond the condylus and insignificant basal elevation it is completely straight and then distally slightly convex. The *chela*, which is 3.3 as long as wide, is scarcely as broad as the trochanter is long; the *hand*, which is about as long as, but 1.4 wider than the tibia, is almost twice as long as broad, about 1.1 wider than deep, and 1.3 as long as the fingers, which are much longer than the hand is wide, and gape a trifle when closed; the lateral outlines are moderately convex, the anterior and the dorsal most distinctly so, and in a less degree the ventral. Both fingers bear anteriorly three *accessory* teeth, while posteriorly the immovable finger has four teeth and the movable finger five. The number of "*spots*" is extremely small, as the movable finger does not seem to possess any, in contradistinction to the immovable finger, which anteriorly has two groups of three spots close together and posteriorly only two close together (figs. 25 *b-c*).

*Coxæ* (text-fig. 71).—The second as well as the third pair are distinctly widened out towards the extremity; at the base they become suddenly narrower, especially the second pair. The fourth pair are quadrangular, scarcely widened out towards the extremity, and have the hinder, slightly concave margin well separated from the inner and almost 1.5 longer.



*Ch. ellingsenii*, sp. n., ♀. Fourth pair of coxæ.  $\times 44$ .

*Legs* (Pl. XXXI. figs. 25 *d-e*).—The proximal joints are only indistinctly granular. The hairs of the dorsal side are rather short, or short and pointed, with a median and a terminal tooth; the hairs of the ventral side are longer and more or less completely simple. The tarsal "*tactile*" hair was missing in the specimen described, but in another a very long one placed somewhat behind the middle and as long as the distance to the thigh was observed. The legs are extremely long and slender, and the trochantin of the first pair is much deeper than the femur proper, while the tibia is about 1.1 as long as the *tarsus*, which is 5.8 as long as deep; the *femur* of the fourth pair of legs is 3.3 as long as deep, scarcely 1.1 as long as the tibia, and at least twice lower than the *tarsus* is long.

*Colour*.—The palps are light or dark reddish brown, and the body is brown.

*Measurements*.—Cephalothorax 1.035 (0.920); abdomen 2.415 (1.245) mm.

Palps: trochanter 0.552 (0.310); femur 1.012 (0.335); tibia 0.989 (0.375); hand 0.989 (0.529), depth 0.483; finger 0.736 mm.

Leg I.: femur 0.676 (0.175), trochantin 0.144 (0.190); tibia 0.532 (0.114); tarsus 0.486 (0.084) mm.

Leg IV.: femur 0.950 (0.288); tibia 0.874 (0.167); tarsus 0.585 (0.114) mm.

*Variation*.—The four specimens examined (probably all females) were almost completely alike in all respects, the most important differences being that the colour of

the one female (from New Granada) was much darker and that the transverse stripes of another specimen (from Bogota) were more prominent; the accessory teeth and "spots" differ only in mere trivialities. One startling variation, however, was observed, namely, in the position of the tarsal "tactile" hair, for in the two specimens from New Granada this was placed distinctly behind the middle, but in those from Bogota placed beyond the middle.

*Material*.—I have examined two females of this species from New Granada and two from Bogota (♀?), all four belonging to the British Museum (Keyserling Coll.).

*Remarks*.—This species seems to be very similar to *Ch. patagonicus* Tullgr. (cf. 13. pp. 155–157), but as it has the hand 1.3 instead of as long as the fingers, and narrower instead of much wider than the trochanter is long, and as also minor differences were observed, I do not think it correct to refer it to this species. To *Ch. elegans* Balz. (II. pp. 520–521, pl. 10. fig. 12) it bears also great similarity, but may be distinguished by the shorter hairs of the femur, which is not attenuated and less convex anteriorly, as well as by the less strongly convex outlines of the tibia.

d. Subgroup of CHELIFER ARGENTINUS Thor.

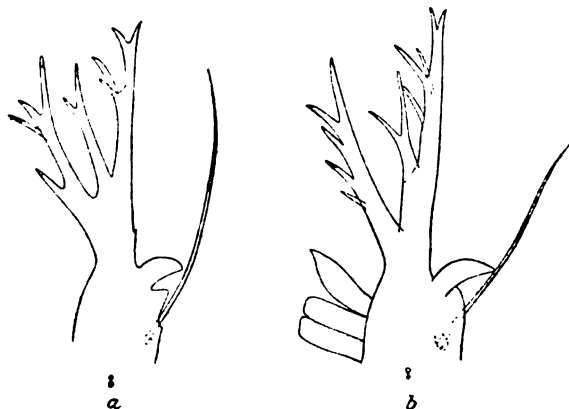
*Flagellum consists of three hairs; galea almost alike in ♂ and ♀. Cephalothorax with or without ocular spots, and with distinct median and indistinct posterior transverse stripe. Tibia of palps with two posterior "tactile" hairs in middle; usual hairs stiff, pointed, and almost simple. "Tactile" hair of tarsus IV.  $\frac{1}{4}$ – $\frac{1}{5}$  removed from the base; in the middle of tibia a long, slender, completely simple hair.*

Ocular spots are generally well developed, but real eyes are never found. The cephalothorax, which is seldom distinctly granular, but generally almost smooth, has the anterior transverse *stripe* broad and fairly distinct, while the posterior is rather indistinct or even wanting. The *abdomen*, which has all its tergites except the first and last one longitudinally divided, has along their hindmost margin a variable number of more or less long, stiff, pointed, and almost simple hairs in addition to a median and a single or two lateral hairs on each side in front of the row, in the median segments at least. The tenth tergite as well as the sternite has a pair of "tactile" hairs, while the eleventh has two. As far as the more detailed arrangement of the hairs is concerned, I refer to the description of *Ch. similis* Balz. and *Ch. argentinus* Thor., as I think that it is the preservation of the specimens only which has made it impossible to find a similar arrangement in all the species of this group. The *genital area* of the male seems to be alike in all the examined species and to be very characteristic. The anterior and posterior plates are of almost equal length, the former having a median concavity fitting into a pronounced convexity on the posterior plate; through the skin accessory glands exactly like those found in *Ch. cimicoides* F. as well as an undivided elongated testis can be seen in transparent specimens.

The *galea* varies from a very simple form with few teeth to a large profusely branched

organ; but in neither case is any sexual difference observable (*cf.* text-figs. 72 & 73). The *flagellum* consists always of three hairs. The *palps* are generally polished, and granular only on the anterior surface. In addition to the usual fairly long, stiff, pointed, and not completely simple hairs, very long slender and completely simple hairs,

Text-figs. 72 &amp; 73.



*Ch. macrochelatus* Töm. Right galea of ♂ and ♀. × 200.

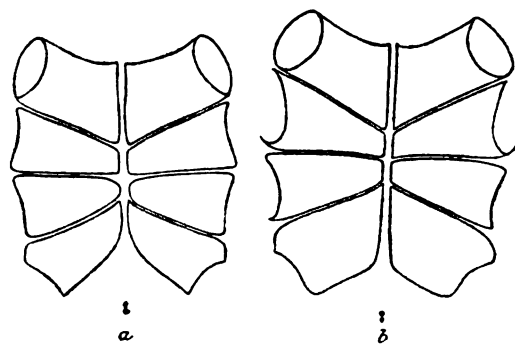
are present, viz., a single ventral hair on the trochanter in the middle; on the femur posteriorly a single hair in the middle and two terminal hairs of which the ventral is the longer; the tibia has two such hairs posteriorly in the middle, one more proximal nearer the ventral margin, and one more dorsal nearer the dorsal margin; the hand has basally one of these hairs posteriorly and another ventrally, and beyond the middle a single ventral hair. The fingers bear in addition to the usual twelve tactile hairs on the immovable finger a single long and slender hair dorsally in the middle, and on the movable finger two beyond the middle. All the above-mentioned hairs were only observable in a few forms, but their fragility taken into consideration, I think we are right in regarding them as constant within this subgroup. The fingers in some species gape considerably in the male, and are provided with a very varying number of accessory teeth, which are, however, always more numerous posteriorly than anteriorly. The number of spots is variable, but is generally great, and anteriorly behind the two basal "tactile" hairs of the immovable finger there are at least a few.

The *coxæ* are generally very similar to those figured of *Ch. argentinus* Thor., and are in some degree sexually different (text-figs. 74 & 75). The *legs* bear, in addition to the usual fairly long stiff hairs, very long and slender, most often completely simple hairs, a single ventral one on the trochanter and trochantin, terminally a single one, not always completely simple, dorsally on the femur, as well as a single one on the tibia, somewhat beyond or behind the middle. The tarsal "tactile" hair is  $\frac{1}{4}$ – $\frac{1}{5}$  removed from the base and about as long as the tarsus. The legs are fairly long and slender;



the femur is not very much longer than the tibia, and distinctly (1·4–2) as low as the femur is deep; the tibia of the first pair is generally 1·2 as long as the tarsus. In two species I have found curiously developed teeth on the claws, the presence of which does not necessarily show that the two species are closely allied (*cf.* below).

Text-figs. 74 &amp; 75.

*Ch. argentinus* Thor. Coxæ of ♂ and ♀. × 37.

This subgroup is in the main identical with Balzan's "*Lamprochernes* Töm.," with the important exception that those species which he mentions from Asia and Africa must be expelled and be referred to the group of *Ch. birmanicus* Thor., which in external appearance is very similar to the *Ch. argentinus* Thor., but has scarcely any claim to nearer relationship. All the species which I have examined of this group go naturally together; of those which I have not examined I refer without hesitation *Ch. ovatus* Balz. to it, while the position of *Ch. elegans* Balz., *Ch. venezuelanus* Balz., and *Ch. brasiliensis* Dad. is somewhat doubtful. The species of this group fall again into minor divisions: *Ch. communis* Balz. and *Ch. intermedius* Balz. stand closely together; *Ch. nodulimanus* Töm. and *Ch. nitidus* Ell., two species of very different appearance, are closely connected with each other by a number of intermediate forms (*cf.* Ellingsen, 18. p. 6).

As the species of this subgroup are very variable and often difficult to determine, a few words may perhaps be added about the specific characters. In the first place, the sex of a specimen must be taken into account both in description and in examination, as the shape of the palps generally varies considerably in male and female. The trochanteral protuberances are of great importance; the width and the depth of the hand should always be sharply distinguished from each other, and are with profit compared to each other as well as to the length of the hand and finger. The number of accessory teeth and "spots" are of value, but the variations (which are often considerable) should be taken into account. The proportion between the joints of the legs is, of course, of importance.

*Synopsis of Species.**a.* Claws without teeth.*a*<sup>1</sup>. Femur of the palps almost 3 as long as wide.*a*<sup>2</sup>. Trochanter strongly bigibbose. Tibial stalk rather short.Galea with teeth only . . . . . 36. *Ch. elegans* Balz.*b*<sup>2</sup>. Trochanter only strongly gibbose dorsally. Tibial stalkextremely long and slender. Galea branched . . . . . 37. *Ch. venezuelanus* Balz.*b*<sup>1</sup>. Femur of the palps 2·5 or less as long as wide.*a*<sup>3</sup>. Movable finger with "spots" anteriorly. Femur about 2 as long as wide.*a*<sup>4</sup>. Hand 1·8 as long as finger, which is shorter than hand wide . . . . . 39. *Ch. ovatus* Balz.*b*<sup>4</sup>. Hand 1·4–1·5 as long as finger, which is at least 1·1 as long as hand wide.*a*<sup>5</sup>. Tibia less than 2 as long as wide. Chela 2·7 as long as wide. Hand wider than deep. . . . . 41. *Ch. intermedius* Balz.*b*<sup>5</sup>. Tibia at least 2 as long as wide. Chela 3 as long as wide. Hand at least as deep as wide . . . . . 42. *Ch. communis* Balz.*b*<sup>3</sup>. Movable finger without "spots" anteriorly.*a*<sup>6</sup>. Hand 1·8 as long as finger, which is shorter than hand is wide . . . . . 39. *Ch. ovatus* Balz.*b*<sup>6</sup>. Hand 1·5 as long as finger.*a*<sup>7</sup>. Femur as well as tibia scarcely (♂) or about 2 as long as wide . . . . . 38. *Ch. subovatus*, sp. n.*b*<sup>7</sup>. Femur as well as tibia more than 2 as long as wide.*a*<sup>8</sup>. Finger 1·4 as long as hand wide. Hand not more than 1·2 as long as finger. Tibia of ♂ scarcely produced. Small species.*a*<sup>9</sup>. Chela 3·3 as long as wide. Hand 1·1 as wide as deep. Finger 1·5 as long as hand wide. Galea with teeth. Tibia 0·647 mm. . . . . 43. *Ch. nitidus* Ell.*b*<sup>9</sup>. Chela 3 as long as wide. Hand less than 1·1 as wide as deep. Finger 1·4 as long as hand wide. Galea branched. Tibia 0·815 mm. . . . . 44. *Ch. similis* Balz., ♂.*b*<sup>8</sup>. Finger not more than 1·3 as long as hand wide. Larger species. Tibia of ♂ generally produced.*a*<sup>10</sup>. Hand a trifle wider than deep (♀) or scarcely deeper than wide (♂). Granulation of cephalothorax wanting or indistinct. Tibia of ♂ slightly produced.*a*<sup>11</sup>. Smaller species. Long hair on palps. Less branched galea. Tibia 0·828 mm. . . . . 44. *Ch. similis* Balz., ♀.*b*<sup>11</sup>. Larger species. Moderately long hair on palps. Strongly branched galea. Tibia 1·02 mm. . . . . 45. *Ch. argentinus* Thor.

- b*<sup>10</sup>. Hand as deep as wide (♀) or at least 1·3 as deep as wide (♂). Granulation of cephalothorax fairly distinct. Tibia distinctly produced in ♂.
- a*<sup>12</sup>. Finger 1·2 (♀) or 1·05 (♂) as long as hand deep. Tibial protuberance not very long. Fingers gape moderately when closed. Tibia 1·32 mm. . . . . 46. *Ch. macrochelatus* Töm.
- b*<sup>12</sup>. Finger 1·1 shorter than hand deep. Tibial protuberance long and conical. Fingers gape considerably when closed. Tibia 1·91 mm. . . . . 47. *Ch. nodulimanus* Töm., ♂.
- c*<sup>3</sup>. . . . . 40. *Ch. brasiliensis* Dad.
- b*. Claws of the fourth pair of legs with big median teeth.
- a*<sup>13</sup>. Hand 1·4 as deep as wide and 1·3 as long as finger, which is a little shorter than hand deep. Tibia with long slender stalk and with conical protuberance. Femur exteriorly shaggy, with long slender simple hairs. . . . . 48. *Ch. cervus* Balz., ♂.
- b*<sup>13</sup>. Hand 1·1 as wide as deep and 1·5 as long as the finger, which is 1·2 as long as hand deep. Tibia with short stalk and not conically produced. Femur with usual hairs posteriorly. . . . . 49. *Ch. depressimanus*, sp. n., ♀.

## 36. CHELIFER ELEGANS Balz.

1891. *Lamprochernes elegans* Balzan, (11) pp. 520–521, pl. 10. figs. 12–12 *a*.

Cephalothorax has a single transverse *groove* and is minutely granular. *Galea* with short branches. The palps are granular. The *trochanter* is strongly bigibbose; the *femur*, which is 2·9 as long as wide, is posteriorly beyond stalk gradually convex. The *tibia*, which has a rather short and well-defined stalk, is 2·4 as long as wide, and is anteriorly moderately convex; posteriorly, beyond the prominent condylus which is separated by a deep incision from the insignificant basal elevation, it is first almost straight and then moderately convex. The *hand* is 1·4 as wide as tibia and 1·5 as long as the finger, which is 1·3 as long as hand is wide. As none of the usual slender hairs on the palps are observed in Balzan's figure, and as the usual hairs are rather short, we cannot regard the position of this species within the subgroup of *Ch. argentinus* Thor. as secure; a new examination of the palps, but especially of the legs, will be necessary ere the question can be settled. Perhaps it is related to *Ch. ellingsenii*, sp. n., and *Ch. patagonicus* Tullgr.; regarding the differences I refer to the description of these species.—Venezuela.

## 37. CHELIFER VENEZUELANUS Balz.

1891. *Lamprochernes venezuelanus* Balzan, (11) p. 518, pl. 9. figs. 9–9 *a*.

Cephalothorax minutely granular with distinct transverse *stripe*. *Galea* is well-branched. The *trochanter* is strongly produced dorsally; the *femur*, which is 3 as

long as wide, is rather gradually convex posteriorly; the *tibia*, which has a very long and slender stalk and is 2.3 as long as wide, is anteriorly slightly convex and posteriorly beyond the elongated basal elevation first concave and then moderately convex. *Hand* is 1.2 as wide as *tibia*, but 1.1 as long, and 1.4 as long as the finger, which is almost 1.4 as long as hand is wide. The position of this species cannot yet be regarded as secure.—Venezuela.

38. CHELIFER SUBOVATUS, sp. n. (Plate XXXI. figs. 26 a-f.)

*Male.*

*Cephalothorax*.—*Ocular* spots rather indistinct. The cephalothorax, which is somewhat longer than wide, has the anterior broad transverse *striae* fairly prominent and straight, like the rather indistinct posterior one. The integument is almost smooth or completely so, with rather long hairs.

*Abdomen*.—The abdomen, which is long and slender, has all the tergites, with the exception of the first and hindmost part of the eleventh, longitudinally divided; the sclerites are smooth and have along the hindmost margin from 12–14 not very long hairs, and in front of the row in the median segments two lateral and a single median hair, as far as could be observed; last segments with “tactile” hairs (*cf.* below).

*Antennæ*.—The slender and fairly long *galea*, which extends distinctly beyond the terminal hair, has distally about six branches, decreasing towards the end.

*Palps* (Pl. XXXI. figs. 26 a-d).—The palps are only minutely and not very distinctly granular posteriorly in the trochanter and anteriorly in the three following joints. The hairs are fairly long or long; the usual slender and completely simple hairs are partly missing in specimens examined. The *trochanter*, which is 1.6 as long as wide, is anteriorly slightly convex, and posteriorly produced into a short rounded protuberance; dorsally it is prolonged into a deep, somewhat conical and rounded protuberance, and its depth is lower than that of the femur. The *femur* has a short and well-defined stalk, beyond which it is distinctly attenuated. It is scarcely twice as long as wide; the anterior outline is moderately convex and then slightly concave, while the posterior, beyond the stalk, is very abruptly convex and then almost straight; dorsally it is even more suddenly raised and then very slightly convex to the end. The *tibia*, which has a rather short and well-defined stalk, is a little longer and wider than the femur, and it is 1.8 as long as wide; anteriorly it is very strongly convex, almost semicircular in the middle, and scarcely concave terminally; posteriorly, beyond the prominent condylus and low, but fairly distinct, basal elevation, it is almost straight and then terminally distinctly convex; the dorsal outline is only slightly convex, while the ventral is moderately so. The *chela*, which is 2.8 as long as wide, is about 1.1 broader than the trochanter is long; the *hand*, which is a little longer and 1.3 wider than the *tibia*, is 1.8 as long as wide, about 1.1 wider than deep, and almost 1.4 as long as the fingers, which are almost 1.2 longer than the hand is wide, and scarcely



gape when closed; anteriorly the outline is only slightly convex, and so are the dorsal and ventral outlines, while the posterior is moderately so. Anteriorly the immovable finger has four terminal *accessory* teeth and posteriorly seven, while the movable finger has three and ten respectively. The immovable finger has anteriorly four or five "spots" behind the basal tactile hairs, and from two to four between and beyond (figs. 26 *c-d*), and posteriorly about four beyond the basal hairs, while the movable finger has no spots either anteriorly or posteriorly.

*Coxæ*.—The fourth pair are of a somewhat triangular appearance, as the angle between the inner and the hinder margin is very obtuse; the former of these margins is at least twice as long as the latter.

*Legs*.—The hairs are fairly long, and in addition to the usual slender and completely simple hairs, one as long as the terminal hair of the femur is placed dorsally just behind the tip of the femur of the fourth pair of legs. The legs are rather short and clumsy; the tibia of the first pair of legs is 1.2 as long as the *tarsus*, which is 4.4 as long as deep; the *femur* of the fourth pair of legs is 2.4 as long as deep, 1.1 as long as the tibia, and 1.4 lower than the tarsus is long.

*Colour*.—The palps and the anterior portion of the cephalothorax are reddish brown, while the rest of the body is brown or yellowish.

*Measurements*.—Cephalothorax 0.805 (0.690); abdomen 1.840 (1.035) mm.

Palps: trochanter 0.437 (0.276); femur 0.713 (0.368); tibia 0.736 (0.405); hand 0.782 (0.483), depth 0.437; finger 0.575 mm.

Leg I.: femur 0.517 (0.175), trochantin 0.091 (0.182); tibia 0.410 (0.118); tarsus 0.334 (0.076) mm.

Leg IV.: femur 0.669 (0.278); tibia 0.608 (0.164); tarsus 0.395 (0.106) mm.

#### *Female.*

*Abdomen*.—The abdomen is much longer and more slender.

*Palps* (Pl. XXXI. figs. 26 *e-f*).—The dorsal protuberance of the *trochanter* is somewhat lower and more rounded. The *femur*, which is distinctly twice (2.1) as long as broad, appears much more slender and has the posterior as well as the dorsal outlines more evenly convex beyond the stalk. The *tibia*, which is just twice as long as broad, appears much more slender and has the anterior as well as the posterior outlines less distinctly convex. The *chela* is 2.7 as long as wide, and the *hand* as well as the fingers are shorter and more clumsy than in the male; hand is namely 1.4 broader than tibia, 1.6 longer than wide, distinctly 1.1 wider than deep, and 1.5 longer than the fingers, which are only 1.1 longer than the hand is wide.

*Coxæ*.—The fourth pair of trapezoidal appearance, as the angle between the interior and posterior margins is much better defined; the posterior margin is even shorter.

*Legs*.—The legs are perhaps a little more slender, the tarsus of the first pair being, for instance, 4.5 as long as deep.

*Measurements*.—Cephalothorax 0·805 (0·690); abdomen 2·530 (1·035) mm.

Palps: trochanter 0·460 (0·276); femur 0·759 (0·355); tibia 0·782 (0·391); hand 0·851 (0·510), depth 0·460; finger 0·575 mm.

Leg I.: femur 0·547 (0·182), trochantin 0·091 (0·190); tibia 0·433 (0·118); tarsus 0·357 (0·079) mm.

Leg IV.: femur 0·725 (0·296); tibia 0·623 (0·167); tarsus 0·418 (0·114) mm.

*Variation*.—A single male from the same locality as the typical one differed by the very prominent basal elevation of the tibia.

*Material*.—I have examined four specimens (2 ♂ and 2 ♀) from Argentina, 2 specimens (♂ and ♀?), collected by Dr. W. Sörensen under bark at Riacho dell' Oro, and two others (♂ and ♀?), sifted by Dr. Meinert, at La Moka, in the month of August.

*Remarks*.—This species seems to be nearly related to *Ch. ovatus* Balz., but differs by its much smaller size, by the tibia of the palps, which is less strongly convex, and by the hand, which is only about 1·5 not 1·8 as long as the fingers, which are distinctly longer, not shorter, than hand is wide. From *Ch. argentinus* Thor. and other species, in which the movable finger of the palps has no spots anteriorly, it differs by less slender palps. From *Ch. communis* Balz., as well as from *Ch. intermedius* Balz., it differs by the absence of spots on the movable finger; from the former of these also by the tibia, which has a short stalk and is only twice or less as long as broad, and from the latter by the tibia of the male, which is not produced anteriorly and dorsally.

#### 39. CHELIFER OVATUS Balz.

1891. *Lamprochernes ovatus* Balzan, (11) p. 519, pl. 9. figs. 10–10 a.

This large species may perhaps most easily be recognised by the following structures: the *galea* is moderately branched; the *femur* of the palps is about 2·3 as long as wide; the *tibia*, which has both lateral outlines equally and distinctly convex, is twice as long as wide, and 1·3 narrower than the *hand*, which is as wide as the finger is long and 1·8 longer.—Venezuela.

#### 40. CHELIFER BRASILIENSIS Dad.

1889. Daday, (9) pp. 23–24, tab. ii. figs. 5 & 15.

Cephalothorax smooth and polished, with single transverse *stripe*; the *galea* is well branched; the *tibia* is rather suddenly convex anteriorly and shorter than *hand*, which is about as long as finger. A re-examination of the typical species is necessary, as the description is too imperfect to be of any value.—Brazil.

41. CHELIFER INTERMEDIUS Balz. (Plate XXXI. figs. 27 *a-d*.)1891. *Lamprochernes intermedius* Balzan, (11) pp. 515-516, pl. 9. figs. 6-6 *a*.1902. *Chelifer rotundatus* Ellingsen, (15) pp. 151-152.1905. *Chelifer intermedius* Ellingsen, (18) pp. 8-10.1907. *Chelifer intermedius* Tullgren, (23) pp. 52-53, figs. 13 *a-f*.*Male.*

*Cephalothorax*.—*Ocular* spots fairly distinct. The cephalothorax, which is somewhat longer than wide, has the anterior, almost straight, transverse *stripe* broad and fairly prominent, in contradistinction to the rather indistinct posterior one. The integument is smooth, somewhat polished in front of the median stripe, and provided with fairly long hairs.

*Abdomen*.—The abdomen, which is fairly long and slender, has all the tergites, except the first and the last, longitudinally divided; the sclerites are almost smooth and have along their hindmost margin in the median segments from 14-16 long and moderately long hairs, in addition to two lateral and a single median one on each side in front of the row. Number of "tactile" hairs on last segments is probably as in *Ch. similis* Balz., but could not be investigated in the specimen examined.

*Antennæ*.—The *galea*, which is fairly long and slender, extends distinctly beyond the terminal hair and has from 6-10 branches differing in length.

*Palps* (Pl. XXXI. figs. 27 *a-d*).—Anterior surfaces of the joints minutely and not very distinctly granular. The hairs are long or even very long. The *trochanter*, which is about 1.5 as long as wide, is slightly convex anteriorly, and posteriorly is produced into a short basal protuberance; dorsally it is prolonged into a deep conical and somewhat rounded protuberance, and its depth is less than that of the femur. The *femur* has a short and well-defined stalk, beyond which it tapers towards the extremity. It is about 1.9 as long as wide; the anterior outline is slightly convex and then concave, while the posterior beyond the stalk is very abruptly convex and then almost straight; dorsally it is somewhat more regularly, though more strongly, convex beyond the stalk, and then slightly convex, most raised towards the middle, from which it gradually slopes towards the end. The *tibia*, which has a rather short and well-defined stalk, is a little longer and wider than the femur, and is 1.8 as long as wide; anteriorly it is very strongly convex, almost semicircular in the middle and then terminally very slightly concave; posteriorly beyond the rather small condylus and low ill-defined basal elevation it is almost straight and then strongly convex; the ventral margin is gradually and strongly convex in contradistinction to the dorsal, which is somewhat produced in the middle (figs. 27 *b-d*). The *chela*, which is about 2.6 as long as wide, is about 1.3 as broad as the trochanter is long; the *hand*, which is distinctly longer and 1.3 wider than the tibia, is 1.6 as long as wide, only a trifle wider than deep, and 1.5 as long as the fingers, which do not

gape when closed and are scarcely 1.1 as long as the hand is wide; the hand is moderately convex anteriorly and dorsally, but only slightly so posteriorly and ventrally. Anteriorly the fingers bear only a few *accessory* teeth distally (fig. 27 *c*) and posteriorly about ten. The immovable finger has anteriorly from 11–18 “spots” arranged somewhat differently in the various specimens, in two groups (*cf.* fig. 27 *c*), and the movable finger has from three to five spots in the basal half; posteriorly the spots in the single specimen examined are placed as shown in figure (fig. 27 *d*).

*Coxæ*.—The fourth pair are somewhat triangular, as the hinder and inner margins, which are of about equal length, are not well distinguished from each other, the angle between being very obtuse.

*Legs*.—The hairs are moderately long. The legs are rather short and clumsy; the tibia of the first pair of legs is 1.2 as long as the *tarsus*, which is four times as long as deep; the *femur* of the fourth pair of legs is 2.3 as long as deep, 1.1 longer than the tibia, and 1.6 lower than the tarsus is long.

*Colour*.—The palps are dark reddish brown; the cephalothorax and the abdomen brownish.

*Measurements*.—Cephalothorax 0.805 (0.735); abdomen 2.530 (0.966) mm.

Palps: trochanter 0.395 (0.265); femur 0.690 (0.368); tibia 0.725 (0.391); hand 0.820 (0.529), depth 0.515; finger 0.555 mm.

Leg I.: femur 0.471 (0.175), trochantin 0.084 (0.179); tibia 0.357 (0.114); tarsus 0.304 (0.076) mm.

Leg IV.: femur 0.588 (0.258); tibia 0.532 (0.144); tarsus 0.365 (0.095) mm.

*Variation*.—The specimen which Mr. Ellingsen kindly sent me for examination differed by the less slender abdomen and more powerful palps, but scarcely in any character of importance.

#### *Female.*

*Cephalothorax &c.*—The second transverse stripe is obsolete; the abdomen in the specimen examined is rather clumsy, being dilated with eggs. The arrangement of the hairs is in the main as in *Ch. similis* Balz. The *galea* of the antennæ is almost exactly similar to Balzan's figure 8 *a*, pl. 9.

*Palps*.—The *trochanter* has the dorsal protuberance somewhat lower and more rounded and is 0.7 as long as wide. The *femur*, which is comparatively more long and slender, viz. 2.1 as long as wide, is posteriorly as well as dorsally less abruptly convex. The *tibia*, which is about 1.9 as long as wide, is anteriorly less strongly convex, and has posteriorly the condylus as well as the basal elevation more prominent. The *chela*, which is 2.7 as long as wide, is only 1.1 broader than the trochanter is long; the *hand* is 1.7 longer than deep and 1.1 wider than deep.

*Coxæ*.—The fourth pair are trapezoidal, at least as long as broad, with the inner margin well separated from the much shorter hinder one.



*Legs.*—The *femur* of the fourth pair of legs is 2·5 as long as deep and 1·5 lower than the tarsus long.

*Colour.*—The palps are lighter brown.

*Measurements.*—Cephalothorax 0·920 (0·805); abdomen 3·5 (2·00) mm.

Palps: trochanter 0·552 (0·322); femur 0·920 (0·437); tibia 0·943 (0·483); hand 1·035 (0·621), depth 0·565; finger 0·690 mm.

Leg I.: femur 0·684 (0·220), trochantin 0·114 (0·236); tibia 0·532 (0·137); tarsus 0·433 (0·106) mm.

Leg IV.: femur 0·836 (0·334); tibia 0·760 (0·182); tarsus 0·509 (0·129) mm.

*Material.*—Of this species I have examined four specimens (3 ♂ and 1 ♀ ?) from Rio Janeiro and a male from Lagoa Santa, collected by Reinhardt; a male collected in the month of December at Los Trinchéras, and the female described collected on a road at La Guayra, Caracas, in the month of July by Dr. Meinert. This species has previously been recorded from Venezuela, Ecuador, and Brazil.

*Remarks.*—That the described males, which I had the good luck to be able to compare with a specimen determined by Mr. Ellingsen, ought to be referred to *Ch. intermedius* Balz., I regard as certain in spite of their much smaller size; they differ from Ellingsen's description (18. p. 9) by the femur, which is scarcely 1·2 instead of 1·5 deeper than wide. I think that the female mentioned is most naturally referred to the same species in spite of the differences enumerated above.

#### 42. CHELIFER COMMUNIS Balz. (Plate XXXI. figs. 28 a-g.)

1880. Balzan, (10) pp. 416–417, tav. xiii. figs. 4–4 b.

1891. Balzan, (11) p. 548.

1902. ? Ellingsen, (15) pp. 167–168.

1905. ? Ellingsen, (18) p. 10.

1905. ? Ellingsen, (19) p. 324.

#### *Male.*

*Cephalothorax.*—*Ocular* spots not very distinct. The cephalothorax, which is distinctly longer than wide, has two broad, almost straight, transverse *stripes*, of which the anterior is the more prominent. The integument is smooth and the hairs are fairly long.

*Abdomen.*—The abdomen, which is exceedingly long and slender, has all the tergites with the exception of the first and the last longitudinally divided; the sclerites are smooth and have along their hindmost margin about 14 hairs in addition to generally two lateral and a single median one in front of the row on each side, at least in the median segments; the arrangement of “tactile” hairs probably as in variation (*cf.* below).

*Antennæ.*—The rather short *galea*, which extends only slightly beyond the terminal hair, is bifurcate and provided with about six branches, arranged from base to the tip.

*Palps* (Pl. XXXI. figs. 28 *a-c*).—The palps are smooth except on the anterior surfaces, which are minutely and not very distinctly granular. The hairs are fairly long or long. The *trochanter*, which is 1.6 as long as wide, is almost straight anteriorly, and posteriorly is produced into a short basal protuberance; dorsally it is prolonged into a very deep, almost triangular, somewhat blunt process, and its depth is only a little less than that of the femur. The *femur* has a short and well-defined stalk, beyond which it is slightly attenuated towards the extremity. It is 1.9 as long as wide and distinctly (1.1) deeper than wide; the anterior outline beyond the stalk is first slightly convex and then a trifle concave, while the posterior, beyond the stalk, is very abruptly convex and then slightly so or almost straight; dorsally it is more suddenly and more strongly convex beyond the stalk, and then slightly convex, most raised towards the middle, from which it slopes towards the end. The *tibia*, which has a long, slender, fairly well-defined stalk, is longer but scarcely wider than the femur, and is distinctly twice as long as broad; anteriorly it is distinctly convex and then terminally a trifle concave, while posteriorly, beyond the fairly prominent condylus and not very pronounced basal elevation, it is first almost straight and then distinctly convex; the ventral margin is regularly and strongly convex, while the dorsal just beyond the stalk is rather suddenly, but not very distinctly, convex for a short distance and then almost straight, sloping towards the end. The *chela*, which is almost three times as long as wide, is about 1.1 as broad as the trochanter is long; the *hand*, which is as long as, but almost 1.3 as wide as the tibia, is almost 1.4 as long as wide, scarcely 1.1 deeper than wide, and is scarcely 1.3 as long as the fingers, which are 1.3 as long as the hand is wide, but 1.2 as long as deep, and which gape a trifle when closed; the anterior outline is moderately convex, but the posterior as well as the dorsal and ventral ones are only slightly convex. Anteriorly both fingers bear about three *accessory* teeth towards the end (*cf.* fig. 28 *c*), while the number is about ten posteriorly on the immovable as well as on the movable finger. The immovable finger has anteriorly, behind and between the basal "tactile" hairs, about twelve spots, and beyond about five, while the movable finger has eight spots in the basal two-thirds (*cf.* fig. 28 *f*); posteriorly the immovable finger has beyond the basal tactile hairs six and the movable finger four spots.

*Coxæ*.—The fourth pair are more quadrangular than triangular and have the hinder and inner margins, which are well limited from each other, of almost equal length.

*Legs*.—The hairs are moderately long. The legs are moderately long and slender; the tibia of the first pair of legs is 1.1 as long as the *tarsus*, which is 4.7 as long as deep; the *femur* of the fourth pair of legs is 2.6 as long as deep, 1.2 as long as the tibia, and 1.6 lower than tarsus long.

*Colour*.—The palps and head are reddish brown, the rest is pale brown or yellowish.

*Measurements*.—Cephalothorax 0.920 (0.805); abdomen 2.760 (0.989) mm.

Palps: trochanter 0.460 (0.305); femur 0.805 (0.414); tibia 0.851 (0.414); hand 0.851 (0.515), depth 0.552; finger 0.667 mm.

Leg I.: femur 0.585 (0.185), trochantin 0.106 (0.198); tibia 0.464 (0.129); tarsus 0.426 (0.091) mm.

Leg IV.: femur 0.760 (0.296); tibia 0.646 (0.175); tarsus 0.486 (0.114) mm.

*Female.*

*Cephalothorax*.—The posterior stripe is obsolete or very indistinct.

*Palps* (Pl. XXXI. figs. 28 *d-g*).—The dorsal protuberance of the *trochanter* is much lower and more rounded (fig. 28 *e*). The *femur*, which is distinctly attenuated towards the extremity, is 2.1 as long as wide; it is less abruptly convex posteriorly as well as dorsally. The *tibia* has the stalk less slender than in the male, and the dorsal and ventral outlines are less curved. The *chela* is less slender, being scarcely three times as long as wide; the hand is only 1.6 as long as wide, only a trifle deeper than wide, and 1.4 as long as the fingers, which are 1.2 as long as the hand is wide. The variations in number and arrangement of *accessory* teeth and “*spots*,” which are observed when comparing the figures and previous description, are scarcely greater between males and females than between different specimens of the same sex (*cf.* figs. 28 *f-g*).

*Coxæ*.—The fourth pair are very similar to those of the male, the inner margin being only about twice as long as the hinder.

*Legs*.—The *tarsus* of the first pair is only four times as long as deep.

*Measurements*.—Cephalothorax 0.805 (0.690); abdomen 3.2 (1.61) mm.

Palps: trochanter 0.391 (0.253); femur 0.690 (0.322); tibia 0.690 (0.335); hand 0.713 (0.437), depth 0.460; finger 0.529 mm.

Leg I.: femur 0.441 (0.144), trochantin 0.076 (0.160); tibia 0.350 (0.099); tarsus 0.319 (0.076) mm.

Leg IV.: femur 0.638 (0.236); tibia 0.509 (0.140); tarsus 0.388 (0.091) mm.

*Variation*.—♂. Several males collected by Dr. Meinert in La Moka differ from the described one from Bahia by the more slender palps, viz. the femur, which is 2.1 as long as wide, is less abruptly convex posteriorly as well as dorsally; the tibia is 2.2 as long as wide; the other joints also differ in a slight degree, but with regard to these I refer to the measurements. The *legs* are in a remarkable degree more slender, the *tarsus* of the first pair being at least five times as long as deep, and the *femur* of the fourth pair being almost three times as long as deep and 1.7 lower than the tarsus is long. While almost all the *hairs* were missing in the described male, this well-preserved specimen has them well-developed and their number appeared to be greater, viz. from 14–18 along the hindmost margin in addition to two lateral and a single median one in front of the row on each side; a few of the hairs along the margin are sometimes placed a little in front of it; this is especially the case with a very long and slender hair, which in the hindmost segments becomes a “*tactile*” hair exactly as in *Ch. similis* Balz., to

which I refer. The *measurements* are as follows:—Cephalothorax 0·805 (0·690); abdomen 1·040 (0·874) mm.

Palps: trochanter 0·483 (0·299); femur 0·805 (0·368); tibia 0·851 (0·391); hand 0·851 (0·529), depth 0·552; finger 0·647 mm.

Leg I.: femur 0·585 (0·182), trochantin 0·114 (0·196); tibia 0·456 (0·122); tarsus 0·418 (0·080) mm.

Leg IV.: femur 0·798 (0·281); tibia 0·669 (0·160); tarsus 0·479 (0·110) mm.

♀. A female from the same locality as the above-mentioned male differed from the described female in the following respects. The size is much greater; the shape of and the proportion between the joints of the palps are almost exactly alike, the only differences worth mentioning being, that the *tibia* is both longer and wider than the femur, and that the *hand* is scarcely deeper than wide. In contradistinction to the palps, the legs are much longer and more slender, the *tarsus* of the first pair of legs being almost five times as long as deep, and the *femur* of the fourth pair being 2·7 as long as deep and 1·7 lower than the tarsus is long.

The *measurements* are the following:—Cephalothorax 0·920 (0·805); abdomen 4·25 (1·75) mm.

Palps: trochanter 0·506 (0·299); femur 0·828 (0·391); tibia 0·897 (0·425); hand 0·989 (0·575), depth 0·575; finger 0·690 mm.

Leg I.: femur 0·623 (0·185), trochantin 0·114 (0·205); tibia 0·494 (0·135); tarsus 0·441 (0·090) mm.

Leg IV.: femur 0·836 (0·312); tibia 0·722 (0·175); tarsus 0·494 (0·114) mm.

*Material*.—Of this species I have examined a number of specimens, of which only a few are completely similar to those described, most agreeing with the variation. The Danish 'Galathea' Expedition brought home from Bahia the described male and female, the latter carrying a bundle of eggs; Professor Reinhardt collected in Rio Janeiro a single somewhat larger female, which had the tarsus of the first pair of legs 4·4 as long as deep, and the vulva, wide open, showing two remarkable bodies within. In Venezuela Dr. Meinert from August to January sifted ten specimens (6 ♀ and 4 ♂) of very different size, mentioned above under variation; among these a female with a bundle of eggs in the month of December. From New Granada a single female was examined (Keys. Coll.). Mr. H. H. Smith collected a single female with a bundle of eggs, in the Old Botanical Garden, Kingstown, Island of St. Vincent, in the month of October in rotten wood, 500 ft., and three females, carrying bundles of embryos, each bundle like a fruit of a *Malva*, in Bornwood Valley, near Kingstown, 800 ft., Island of St. Vincent, under the bark of rotten log.

This species has previously been mentioned by Balzan from Paraguay and Brazil (Matto Grosso), and by Ellingsen from Argentine, Uruguay, Paraguay, and different localities in Brazil.



*Remarks.*—The small female described from Bahia is completely like Balzan's description as far as it goes, unimportant trivialities in the structure of the galea and less slender femur of palps excepted; certainly it would not be natural to refer the described male to another species in spite of its larger size, as the differences in the palps and partly the legs are of only sexual importance, especially as they are from the same locality. The difference in shape and in the length of the tarsus of the first pair of legs between the female from Bahia and those from La Moka &c. is certainly great; but as specimens are found intermediate in size and partly in length of the tarsus I. (in ♀ from Rio Janeiro 4.4 as long as deep), and as the males from the different localities are even more similar in most respects, I do not think it right to establish a new species.

A single badly preserved male, one of Ellingsen's specimens, differed in several respects from the above; the palps are much larger—tibia, for instance, 1.012 (0.483),—with the tibia almost produced anteriorly (*cf.* Pl. XXXI. fig. 28 *h*) and with the dorsal tubercle of the trochanter much lower and of another shape; the fingers gape moderately when closed and the movable one had no spots anteriorly. On full consideration I am convinced that the examined specimen must be regarded as belonging to another species; but as only one badly preserved specimen was at my disposal, I do not wish to describe it as a new species, but refer to Ellingsen's description (15. pp. 167–168), in which he writes “C'est avec quelque doute que j'ai rapporté cette forme au *Chelifer communis* Balz.” His identification of the specimens from Brazil with *Ch. communis* Balz. was certainly justified, but I scarcely think that the “very small” specimens from Argentine (1905, 18. p. 10) are correctly referred to the same species as the large ones from Brazil. It will only be possible to settle the question of the geographical distribution of these two (three?) species and the correct limitation of *Ch. communis* Balz. by the examination of a very large amount of material.

This species differs from *Ch. intermedius* Balz., chiefly by the tibia, which has a longer and more slender stalk and is at least twice as long as broad, and by the hand, which is wider than deep; the male differs besides by the somewhat triangularly shaped and pointed dorsal process of the trochanter. From the following species, as well as from *Ch. subovatus*, sp. n., it differs by less slender palps and the movable finger, which has “spots” anteriorly.

43. CHELIFER NITIDUS Ell. (Plate XXXI. figs. 29 *a–b*.)

1902. Ellingsen, (15) pp. 155–156.

1905. Ellingsen, (19) p. 324.

*Female.*

*Cephalothorax &c.*—The smooth cephalothorax, which is somewhat longer than wide, with fairly distinct ocular spots, has two almost straight transverse *stripes*, of which the

very broad anterior one is much the more prominent. Abdomen has along the hindmost margin of each tergite about twelve hairs in addition to a single lateral and a median one in front of the row; the "tactile" hairs are arranged as in *Ch. similis* Balz.

*Antennæ*.—The very slender *galea*, which extends distinctly beyond the terminal hair, being almost twice as long as the latter, has about five teeth decreasing in length from the base to the tip.

*Palps* (Pl. XXXI. figs. 29 *a-b*).—The palps are smooth and polished, with very slender hairs. The *trochanter*, which is 1.5 as long as wide, is slightly convex anteriorly and posteriorly slightly produced; dorsally it is prolonged into a low rounded protuberance. The *femur* has a short, well-defined stalk, beyond which it is scarcely attenuated towards the end. It is 2.4 as long as wide; the anterior outline is very slightly convex and then concave, while the posterior, beyond the stalk, is not very abruptly convex, and then almost straight; the dorsal line, beyond the stalk, is moderately convex and then very slightly so. The *tibia*, which is as long as and a little wider than the femur, has a short, not very well-defined stalk and is 2.2 as long as wide; anteriorly it is moderately convex and then a trifle concave, while posteriorly, beyond the not very prominent condylus and almost obsolete basal elevation, it is almost straight and then slightly convex; the dorsal as well as the ventral outlines are slightly convex. The *chela*, which is 3.3 as long as wide, is about 1.1 broader than the trochanter is long; the *hand*, which is a little longer and 1.4 wider than the tibia, is 1.7 as long as wide, scarcely 1.1 as wide as deep, and 1.2 as long as the fingers, which are 1.5 longer than the hand is wide and do not gape when closed; the anterior outline is moderately convex, the posterior as well as the dorsal and ventral areas are only slightly so. Anteriorly the immovable finger has two *accessory* teeth, while the movable has a single one only; the former of the fingers has anteriorly about eleven "spots," arranged as shown in figure (*cf.* above).

*Coxæ &c.*—The fourth pair are almost trapezoidal, with the inner margin about 1.5 as long as the hinder, and with the obtuse angle between them not well defined. The legs appear to be long and slender, but could not be thoroughly investigated in the single specimen which was at my disposal.

*Colour*.—Palps light reddish brown.

*Measurements*.—Cephalothorax 0.736 (0.621); abdomen 2.30 (1.38) mm.

Palps: trochanter 0.345 (0.230); femur 0.647 (0.265); tibia 0.647 (0.285); hand 0.713 (0.400), depth 0.368; finger 0.598 mm.

*Material*.—By the kindness of Mr. Ellingsen I have been able to examine one of his original specimens (♀); the species has only been collected in Ecuador.

*Remarks*.—For several details I refer to Mr. Ellingsen's description. This species is well defined from the other species of this group by its very minute size, and slender palps with fingers only a little shorter than the hand.

44. CHELIFER SIMILIS Balz. (Plate XXXI. figs. 30 *a-f*.)1891. *Lamprochernes similis* Balzan, (11) p. 517, pl. 9. figs. 8-8 *a*.*Male.*

*Cephalothorax*.—Large distinct *ocular* spots found. The cephalothorax, which is distinctly longer than wide, has two transverse *stripes*, of which the anterior almost straight one is very broad and prominent, while the posterior is slightly curved forwards in the middle and not very distinct. The integument is smooth or almost smooth in the middle, but laterally minutely and not very distinctly granular, and appears polished in front of the anterior stripe; the hairs are moderately long.

*Abdomen*.—The abdomen, which is fairly long and slender, has all the tergites, with the exception of the first and the eleventh, longitudinally divided. The almost smooth tergites have along the hindmost margins from 14-18 *hairs*, which in the same segment vary from rather short, with a few distal teeth, to very long, almost simple ones, but as a whole increase in length towards the end of the abdomen; in addition to these hairs, a long median as well as a single lateral hair (seldom two) on each side are observed. One of the hairs in the row, which already in the fourth tergite is conspicuous by its length, increases in length and is gradually placed somewhat more in front of the marginal row, towards the tip of the abdomen, so that it becomes in the tenth tergite a completely simple "tactile" hair, placed distinctly in front of the row. The eleventh tergite bears two pairs of "tactile" hairs, like the one above mentioned exceedingly long and slender; the corresponding sternite bears two and the tenth only a single pair of these hairs.

*Antennæ*.—The fairly long and slender *galea*, which extends very much beyond the terminal hair, is bifurcate from the middle, each branch with from 2-6 teeth, almost exactly as figured by Balzan (pl. 9. fig. 8 *a*).

*Palps* (Pl. XXXI. figs. 30 *a-f*).—The palps are almost smooth, only the trochanter being rather indistinctly granular posteriorly, the femur minutely, but fairly distinctly so anteriorly, and the tibia, as well as the hand at the base of finger, not very distinctly granular anteriorly; the hairs are long or very long. The *trochanter*, which is about 1.5 as long as wide, is anteriorly slightly convex, and posteriorly produced into a rather low rounded protuberance; dorsally it is prolonged into a deep, conical, somewhat rounded protuberance; the trochanter is much deeper than wide and even deeper than the femur. The *femur* has a short and fairly well-defined stalk, beyond which it is scarcely attenuated towards the end. It is about 2.3 longer than wide; the anterior outline is very slightly convex and then concave, while the posterior, beyond the stalk, is not very abruptly convex and then almost straight; dorsally it is rather suddenly convex beyond the stalk, then gradually convex, not gradually sloping to the tip, but terminally with a slightly marked concavity. The *tibia*, which has a fairly long and not very well-defined stalk, is as long as, but somewhat wider than, the femur

and is scarcely 2·1 as long as wide; anteriorly, beyond the stalk, it is moderately convex and then a trifle concave, while posteriorly, beyond the not very prominent condylus and long, not well-defined basal elevation, it is almost straight, and then terminally moderately convex; the ventral outline is moderately convex, while the dorsal is very slightly so, but with the antero-dorsal surface slightly produced (*cf.* figs. 30 *d-e*). The *chela*, which is distinctly three times as long as wide, is scarcely 1·1 as broad as the trochanter is long; the *hand*, which is a little longer than, but 1·3 as wide as the tibia, is 1·6 as long as wide, a trifle deeper than wide, and scarcely 1·2 longer than the fingers, which are 1·4 as long as the hand is wide and gape slightly when closed; the anterior outline is moderately convex, the posterior and dorsal are slightly so, and the ventral is almost straight. The immovable finger has anteriorly five *accessory* teeth and the movable one three, while both fingers posteriorly possess about 15 accessory teeth (*cf.* figs. 30 *e-f*). Anteriorly the immovable finger has from 5-16 "*spots*" in two groups (fig. 30 *e*) and posteriorly five in a longitudinal row, while the movable finger has only two posteriorly (fig. 30 *f*).

*Coxæ*.—*Cf.* description of following species and text-fig. 74 (p. 291).

*Legs*.—The hairs are long. The legs are long and slender; the tibia of the first pair of legs is about 1·1 as long as the *tarsus*, which is 4·6 as long as deep; the *femur* of the fourth pair of legs is 2·9 as long as deep, a trifle longer than the tibia, and only half as deep as the tarsus is long.

*Colour*.—The palps are light reddish brown, the cephalothorax is somewhat darker brown, and the abdomen again paler brown.

*Measurements*.—Cephalothorax 0·966 (0·805); abdomen 2·070 (1·035) mm.

Palps: trochanter 0·483 (0·322); femur 0·805 (0·345); tibia 0·815 (0·391); hand 0·851 (0·515), depth 0·529; finger 0·736 mm.

Leg I.: femur 0·555 (0·180), trochantin 0·091 (0·190); tibia 0·448 (0·114); tarsus 0·403 (0·088) mm.

Leg IV.: femur 0·684 (0·240); tibia 0·669 (0·140); tarsus 0·471 (0·103) mm.

#### *Female.*

*Palps*.—The *trochanter* is dorsally prolonged into a rather low rounded protuberance. The *femur*, which is about 2·4 as long as wide, is more gradually convex beyond the stalk posteriorly and so it is dorsally without terminal concavity. The *tibia*, which is almost 2·3 as long as broad, has not the antero-dorsal surface produced. The *hand*, which is 1·4 as wide as the tibia, is 1·8 longer than wide, a trifle wider than deep, and 1·3-1·4 longer than the fingers, which are distinctly 1·3 as long as the hand is wide, and which do not gape when closed. The number of *accessory* teeth is somewhat smaller than in the male, while the "*spots*" do not provide any characters of interest.

*Coxæ*.—The fourth pair are very similar to those of *Ch. argentinus* Thor. (*cf.* text-fig. 75), being somewhat trapezoidal with the inner margin almost twice as long as the hinder.



*Legs.*—The legs are perhaps even longer, with the *tarsus* of the first pair 4·7 as long as deep, and the *femur* of the fourth pair scarcely half as deep as the tarsus is long.

*Measurements.*—Cephalothorax 0·966 (0·805); abdomen 2·645 (1·265) mm.

Palps: trochanter 0·460 (0·310); femur 0·805 (0·335); tibia 0·828 (0·368); hand 0·920 (0·515), depth 0·506; finger 0·667 mm.

Leg I.: femur 0·570 (0·190), trochantin 0·091 (0·205); tibia 0·464 (0·114); tarsus 0·418 (0·089) mm.

Leg IV.: femur 0·715 (0·247); tibia 0·705 (0·144); tarsus 0·502 (0·110) mm.

*Abnormality.*—The hindmost segments of the described male show dorsally an abnormal structure, similar to that which I have described in *Ch. javanus* Thor. (31. p. 137, pl. viii. fig. 1 a), though of a less complicated structure. The left exterior fourth of the tenth and the eleventh tergites are laterally completely fused without a trace of limitation between; the two tergites are consequently only distinguished from each other in the right three-fourths; the arrangement of the hairs on the left is somewhat irregular, and the longitudinal line of the tenth tergite is directed obliquely backwards towards the left.

*Material.*—Of this species Dr. Meinert sifted six specimens (2 ♂ and 4 ♀, one with a bundle of eggs) in the month of August at La Moka, and a single female (without date) as well as a single male at Caracas in the month of July. Balzan's specimens are from the Amazons.

*Remarks.*—The identification of this species with Balzan's species I regard as certain, in spite of its larger size and slightly different proportions of the joints of the palps. From *Ch. nitidus* Ell. it differs by larger size, shorter fingers, and bigibbose trochanter; as regards the differences from *Ch. argentinus* I refer to that species.

#### 45. CHELIFER ARGENTINUS Thor. (Plate XXXI. figs. 31 a-f; text-figs. 74-77.)

1877. Thorell, (3) p. 216.

1888. *Ch. capreolus* Balzan, (7) Pug. iii. pl. 2. figs. 1-4.

1890. Balzan, (10) pp. 414-415, tav. xiii. figs. 3-3 b.

1891. *Lamprochernes argentinus* Thor., Balzan, (11) pp. 516-517, pl. 9. fig. 7.

1905. Ellingsen, (17) p. 1.

1905. Ellingsen, (18) pp. 6-8.

1905. Ellingsen, (19) p. 324.

1907. Tullgren, (23) pp. 51-52, figs. 12 a-f.

#### *Male.*

*Cephalothorax.*—Large *ocular* spots fairly distinct. The cephalothorax, which is distinctly longer than wide, has the anterior transverse *stripe* fairly distinct and slightly curved backwards in the middle, while the almost obsolete or rather indistinct

posterior one is slightly curved forwards. The integument is polished, and either completely smooth or very minutely granular, at least in front of the median transverse stripe; the hairs are rather short.

*Abdomen*.—The long and slender abdomen has all the tergites with the exception of the first and the eleventh more or less distinctly divided by a fine longitudinal line. The tergites have their sclerites rather polished and completely smooth or slightly shagreened, and the median ones have along their hindmost margins at least 16 moderately long hairs in addition to a single median and generally two lateral ones in front of the row; the arrangement and number of the tactile hairs are as in the preceding species (*cf.* above).

*Antennæ*.—The *galea*, which extends very much beyond the terminal hair, is moderately long and bifurcate, each branch with a number of ramifications.

*Palps* (Pl. XXXI. figs. 31 *a-b*; text-fig. 76).—The palps are smooth, or almost so, and polished, except the dorsal protuberance of the trochanter and at least the anterior surface of the femur and tibia, which are minutely granular; the hairs are generally long. The *trochanter*, which is 1.6 as long as wide, is anteriorly slightly convex and posteriorly produced into a basal, rounded, and fairly prominent tubercle; dorsally it is prolonged into a deep, somewhat conical, and obtusely-pointed protuberance, which, as shown in text-figure 76, has rather a peculiar shape and has the point directed upwards and towards the extremity; the trochanter is much deeper than wide and is as deep as the femur. The *femur* has a fairly long and well-defined stalk, beyond which it is slightly attenuated towards the end. It is distinctly 2.2 as long as wide; the anterior outline is very slightly convex and then a trifle concave, while the posterior, beyond the stalk, is rather abruptly convex and then almost straight; dorsally it is gradually but distinctly convex, most raised just beyond the middle and then concave; it is about as wide as deep. The *tibia*, which has a fairly long and well-defined stalk, is a little longer and wider than the femur and is 2.1 as long as wide: anteriorly it is beyond the stalk distinctly convex, and posteriorly beyond the condylus and slightly marked basal elevation almost straight or even a trifle concave and then terminally distinctly convex; ventrally it is moderately convex and dorsally slightly produced, while the antero-dorsal surface has generally a moderately deep and rounded tubercle, but sometimes a deeper and more conical one, resembling that of *Ch. machrochelatus* Töm. The *chela*, which is 2.8 as long as wide, is almost 1.2 broader than the trochanter is long; the *hand*, which is somewhat longer, but 1.4 wider, than the tibia, is about 1.6 as long as wide, scarcely 1.1 deeper than wide, and about 1.3 as long as the fingers, which are distinctly 1.2 longer than hand is wide, but scarcely 1.2 longer than hand is deep, and which gape slightly; the lateral outlines are moderately convex, while the

Text-fig. 76.



*Ch. argentinus*  
Thor., ♂. Trochanter and femur of right palp in anterior view.  $\times 24$ .

dorsal and ventral ones are less distinctly so. The number of *accessory* teeth is somewhat variable, but is generally large as shown in figs. 31 *a-b*, viz. eight and six anteriorly, and twelve and fifteen posteriorly, in the immovable and movable finger respectively. The movable finger has anteriorly no "*spots*" and posteriorly only a few, while the number in the immovable finger varies, but is often more or less similar to that represented in the figures (figs. 31 *a-b*).

*Coxæ* (text-fig. 74, p. 291).—The fourth pair are somewhat triangular, distinctly widened out towards the extremity, and have the hinder margin much longer than the inner and not very well separated from it.

*Legs* (Pl. XXXI. figs. 31 *c-d*).—The hairs are moderately long. The legs are long and slender; the tibia of the first pair of legs is 1·2 as long as the *tarsus*, which is five times as long as deep; the *femur* of the fourth pair of legs is 2·9 as long as deep, scarcely longer than the tibia and about half as deep as the tarsus is long.

*Colour*.—The palps and the head are dark reddish brown; the tergal sclerites blackish brown.

*Measurements*.—Cephalothorax 1·150 (0·989); abdomen 2·530 (1·265) mm.

Palps: trochanter 0·598 (0·368); femur 0·966 (0·435); tibia 1·012 (0·495); hand 1·081 (0·690), depth 0·736; finger 0·851 mm.

Leg I.: femur 0·722 (0·220), trochantin 0·144 (0·236); tibia 0·593 (0·140); tarsus 0·494 (0·099) mm.

Leg IV.: femur 0·851 (0·296); tibia 0·851 (0·170); tarsus 0·585 (0·120) mm.

#### Female.

*Palps* (Pl. XXXI. figs. 31 *e-f*; text-fig. 77).—The dorsal protuberance of the *trochanter* is much lower and more rounded (fig. 77); the *femur* is less

Text-fig. 77.



*Ch. argentinus*  
Thor., ♀. Tro-  
chanter and femur  
of right palp in an-  
terior view. ×24.

abruptly convex as well posteriorly as dorsally, and has no terminal concavity dorsally. The *tibia*, which is 2·2 as long as wide, is anteriorly moderately convex, and posteriorly only slightly so terminally; the ventral outline is moderately convex and the dorsal is very slightly so, and has the antero-dorsal surface scarcely produced. The *chela*, which is three times as long as wide, is only 1·1 broader than the trochanter is long; the hand is almost 1·8 as long as wide, a trifle wider than deep, and 1·4 as long as the fingers, which are about 1·3 longer than the hand is either wide or deep, and scarcely gape when closed; the lateral, as well as the dorsal and ventral margins of the hand, are less distinctly convex. The numbers of accessory teeth and of spots are generally somewhat smaller (figs. 31 *e-f*).

*Coxæ* (text-fig. 75, p. 291).—The fourth pair have a quite different shape, being much broader and scarcely widened out towards the extremity, with the inner margin much longer than the hinder and of a somewhat trapezoidal appearance.

*Legs.*—The legs differ only in mere trivialities from those of the male.

*Measurements.*—Cephalothorax 1.150 (1.081); abdomen 3.32 (1.38) mm.

Palps: trochanter 0.575 (0.345); femur 0.966 (0.437); tibia 1.035 (0.460); hand 1.127 (0.647), depth 0.635; finger 0.828 mm.

Leg I.: femur 0.714 (0.205), trochantin 0.137 (0.225); tibia 0.593 (0.137); tarsus 0.479 (0.095) mm.

Leg IV.: femur 0.851 (0.296); tibia 0.558 (0.175); tarsus 0.593 (0.122) mm.

*Variation.*—The numerous specimens of this species which I have examined differ in several respects, viz. size, granulation of the cephalothorax, shape of joints of palps, especially shape of the tibia of the male, &c., but on the whole are as described.

*Material.*—Of this species I have examined a great number of specimens (about 150), most of which were sifted by Dr. Meinert in Venezuela from June to September; several females collected in August carried their eggs fastened to the abdomen. Other specimens were collected in Mexico, Brazil, and Argentine (Dr. W. Sørensen; under bark, Riacho dell' Oro). It has previously been recorded from Venezuela, Ecuador, Brazil, Paraguay, and Argentine.

*Parasitism.*—A male from La Moka had two minute mites, probably larval stages of a *Tyroglyphus*, fastened to the trochantin of the first pair and to the articular membrane between the femur and tibia of the fourth pair respectively.

*Remarks.*—Regarding the differences between this species and *Ch. macrochelatus* Töm. I refer to that species; from *Ch. similis* Balz. it differs by much larger size and shorter hairs, as well as by comparatively shorter and less slender palps—for instance, the fingers, which are 1.2 (♂) or 1.3 (♀), not 1.4, as long as hand is wide.

46. CHELIFER MACROCHELATUS Töm. (Plate XXXI. fig. 32 a; text-figs. 72–73, 78–80.)

1884. Tömösváry, (5) p. 20, tab. i. figs. 12–13.

1891. *Lamprochernes macrochelatus* Töm., Balzan, (11) pp. 513–514, pl. 9. figs. 4–4 a.

1902. Ellingsen, (15) pp. 152–154.

1905. Ellingsen, (17) p. 1.

1905. Ellingsen, (18) p. 6.

1907. *Chelifer nodulimanus* Töm., pars, Tullgren (23) pp. 46–49, figs. 10 a–f.

*Male.*

*Cephalothorax.*—Large distinct *ocular* spots are found. The cephalothorax, which is somewhat longer than wide, has the almost straight broad anterior *stripe* very prominent, while the posterior is less distinct and is slightly curved forwards in the middle; from the anterior stripe to half distance from the front margin a longitudinal groove or depression is found; the second thoracic tergite is divided by a longitudinal dark band.

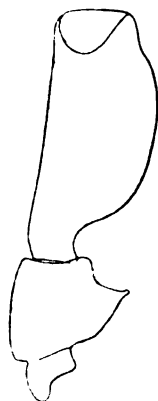
*Abdomen.*—The fairly long and slender, but somewhat depressed abdomen has all

the tergites but the first and the eleventh longitudinally divided. The tergites have the sclerites smooth or indistinctly shagreened, and have along their hindmost margin about 18 moderately long hairs in addition to a median and generally two lateral hairs in front of the row on each side; the number and arrangement of "tactile" hairs are probably as in *Ch. similis* Balz.

*Antennæ* (text-fig. 72, p. 290).—The *galea*, which extends very much beyond the terminal hair, is very powerful and has numerous branches; it is very variable, as seen by comparing text-fig. 72 with Balzan's fig. 4 *a* (pl. 9).

*Palps* (Pl. XXXI. fig. 32 *a*; text-figs. 78–79).—The palps are polished and almost smooth, except the shagreened dorsal tubercle of the trochanter and minutely granular surface of the femur and tibia; the hairs are moderately long or long.

Text-fig. 78.



*Ch. macrocheilus* Töm., ♂.  
Trochanter and femur of right palp in anterior view.  
× 24.

The *trochanter*, which is 1.5 as long as wide, is anteriorly very slightly convex and posteriorly produced into a basal rounded and fairly prominent tubercle; dorsally it is prolonged into a deep protuberance of a characteristic shape, having on the whole a somewhat triangular appearance, with the obtusely-pointed tip directed somewhat towards the extremity; the outline is obtusely-pointed proximally and almost semicircular distally with the tip well-defined from the lower part; the trochanter is much deeper than wide, almost as deep as long, and deeper than the femur. The *femur* has a rather short and well-marked stalk, beyond which it is only slightly attenuated towards the extremity. It is 2.2 as long as wide; anteriorly it is slightly convex and then concave, while the posterior outline beyond the stalk is abruptly convex and then almost straight; the dorsal outline beyond the stalk is abruptly convex and then moderately so, most raised beyond the middle, passing into the rather sudden terminal concavity; the femur is a little deeper than wide. The *tibia*, which has a long fairly well-defined stalk, is somewhat longer and wider than the femur, and is almost 2.2 as long as wide; the anterior outline is first moderately convex and then terminally a trifle concave, while the posterior, beyond the fairly well-marked condylus and elongated, but ill-defined, basal elevation, is very slightly concave and then terminally moderately convex; the ventral outline is moderately convex, while the dorsal is slightly produced; and the antero-dorsal surface forms a somewhat conical, rounded, and very prominent tubercle. The *chela*, which is almost three times as long as wide, is scarcely 1.2 as broad as the trochanter is long; the *hand*, which is about as long as the tibia, but 1.3 as wide, is 1.7 as long as wide, but only 1.3 as long as deep, is 1.3 deeper than wide, and about 1.3 as long as the fingers, which are 1.3 as long as the hand is wide, but only a trifle (1.05) as long as hand is deep, and which gape considerably when closed; the lateral outlines of the hand are only slightly convex and so is the ventral, while the dorsal one is almost semicircular. The



number of *accessory* teeth is very large, viz. anteriorly 10 and 15 in the movable and immovable finger respectively, while both fingers have posteriorly about 30 in addition to the marginal row. The immovable finger has numerous *spots*, especially posteriorly, while the movable finger has only two posteriorly (*cf.* fig. 32*a* and text-fig. 79).

*Coxæ*.—The coxæ are scarcely different from those of *Ch. argentinus* Thor. (*cf.* above).

*Legs*.—The hairs are rather short. The legs are long and slender; the tibia of the first pair of legs is almost 1·3 as long as the *tarsus*, which is 4·5 as long as deep; the *femur* of the fourth is 2·8 as long as deep, scarcely 1·1 as long as the tibia, and about 1·8 lower than the tarsus is long.

*Colour*.—The palps and the cephalothorax are dark reddish brown, while the tergal sclerites are pale brown.

*Measurements*.—Cephalothorax 1·38 (1·20); abdomen 3·0 (1·5) mm.

Palps: trochanter 0·690 (0·460); femur 1·245 (0·552); tibia 1·311 (0·621); hand 1·334 (0·805), depth 1·012; finger 1·058 mm.

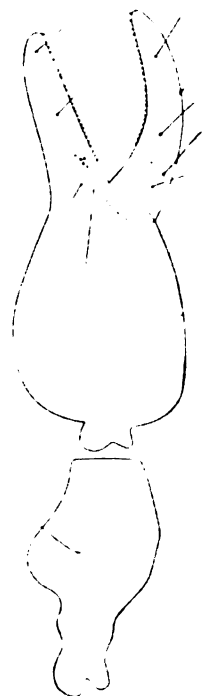
Leg I.: femur 0·897 (0·253), trochantin 0·140 (0·276); tibia 0·736 (0·184); tarsus 0·575 (0·125) mm.

Leg IV.: femur 1·058 (0·375); tibia 1·00 (0·207); tarsus 0·667 (0·156) mm.

#### Female.

*Palps* (text-fig. 80).—The granulation of the palps is perhaps somewhat better marked. The dorsal protuberance of the *trochanter* is somewhat lower and has a similar, but less characteristic shape, as its tip is not marked out from the rest, but regularly rounded, and as the proximal margin is scarcely obtuse-angled; the trochanter is as deep as, not deeper than, the *femur*, which dorsally does not show any trace of terminal concavity. The *tibia*, the stalk of which appears less slender on account of the almost straight posterior margin, has the antero-dorsal surface very slightly produced. The *hand*, which is longer, but 1·4 wider, than the tibia, is 1·9 as long as wide, scarcely deeper than wide, and 1·5 as long as the fingers, which are only 1·2 as long as the hand is wide and scarcely gape when closed; the lateral outlines are a little more distinctly convex than in the male, while the dorsal and ventral ones are less distinctly convex. The number of accessory teeth is much smaller, viz. anteriorly about five in both fingers and posteriorly about twelve, while the number and arrangement of spots is practically as in the male.

Text-fig. 79.



*Ch. macrochelatus*  
Töm., ♂. Tibia and  
chela in posterior  
view. × 24.

Text-fig. 80.



*Ch. macroche-*  
*latus* Töm., ♀.  
Trochanter and fe-  
mur of right palp  
in anterior view.  
× 24.

*Legs.*—The *tarsus* of the first pair is 4·8 as long as deep, and the *femur* of the fourth pair of legs is 2·9 as long as deep, but scarcely longer than the tibia.

*Measurements.*—Cephalothorax 1·380 (1·265); abdomen 2·75 (1·75) mm.

Palps: trochanter 0·736 (0·483); femur 1·311 (0·590); tibia 1·334 (0·635); hand 1·495 (0·874), depth 0·874; finger 1·012 mm.

Leg I.: femur 0·943 (0·276), trochantin 0·161 (0·299); tibia 0·782 (0·184); tarsus 0·598 (0·126) mm.

Leg IV.: femur 1·173 (0·405); tibia 1·150 (0·220); tarsus 0·713 (0·150) mm.

*Variation.*—The specimens examined varied rather considerably in size, those of which the measurements are given being the largest at my disposal; the smallest male examined, which was referred to this species (from La Moka), had the tibia of the palps 1·104 mm. long. A single female from Rio Janeiro, with the tibia 1·15 mm. long, was only with hesitation referred to this species, as the outlines of the tibia were more strongly convex. The characteristic shape of the trochanteral tubercle dorsally, as well as that of the protuberance of the tibia in the male, is in many specimens only slightly pronounced.

*Material.*—Of this species I have examined a number of specimens (22 ♀ and 12 ♂) found beneath the elytra of a specimen of *Acrocrinus longimanus* from Brazil; three small, almost dark specimens from Tobasis Kapa (Keyserling Coll.); Dr. Meinert collected in Venezuela a single small male in the month of December at Hacienda Elias, Los Trinchéras, as well as two in the month of August at La Moka by sifting; Reinhardt collected a single female in Rio Janeiro. This species has previously been recorded from the greater part of the sub-continent, viz. Venezuela, Brazil, Ecuador, Paraguay, and Chile.

*Remarks.*—That the species described above is identical with that described by Balzan as well as Ellingsen under this name I regard as certain, in spite of much larger measurements given by Balzan, especially compared to those of a rather small specimen which I had the opportunity of examining by the kindness of Mr. Ellingsen. This species is very nearly related to *Ch. argentinus* Thor., so nearly that the position of some specimens is not easily ascertained, but I nevertheless regard it as a well-defined species, but one with a very wide range of variation. The female differs generally from that of *Ch. argentinus* Thor. by its larger size, by the less slender, more depressed abdomen, by the more distinctly granular cephalothorax, by the hand, which is at least not wider than deep, and by the fingers, which are only 1·2 longer than the hand is deep, and by the tarsus of the first pair of legs, which is only 4·8 as long as deep. The male differs besides by the characteristic dorsal tubercle of the trochanter, by the pronounced protuberance of the tibia, by the hand, which is 1·3 as deep as wide, and the fingers, which are only 1·05 longer than hand is deep. According to Ellingsen the main character seems to be the granulation of the head, but this scarcely holds good (*cf.* above). Concerning the relation of the described species to that which Tömösváry described, I refer to Ellingsen's discussion (15. p. 154).

## 47. CHELIFER NODULIMANUS Töm. (Plate XXXI. fig. 33 a; text-fig. 81.)

1882. Tömösváry, (4) p. 244.

1884. Tömösváry, (5) p. 26, tab. i. fig. 14.

1889. Daday, (8) pp. 173-174, tab. iv. figs. 3 &amp; 9.

1905. Ellingsen, (18) pp. 3-6.

1906. With, (20) p. 171.

1907. *Chelifer nodulimanus* Töm. pars (?) Tullgren, (23) pp. 46-49, figs. 10 a-f.*Male.*

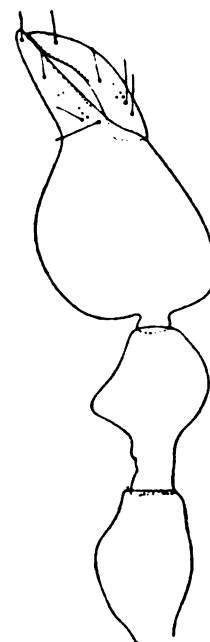
*Cephalothorax*.—Large distinct *ocular* spots. The cephalothorax, which is somewhat longer than wide, has the almost straight anterior transverse *groove* fairly prominent in contradistinction to the posterior less prominent one, which is slightly curved forwards in the middle. The integument in front of the median groove is minutely, but distinctly *granular*; behind it is almost smooth or rather indistinctly granular (specimen from Tobasis Kapa); the hairs are rather short. In front of the anterior groove a longitudinal depression is found, passing into a deep cavity situated almost in the middle of the head (*cf.* Ellingsen, 18. p. 4).

*Abdomen*.—The moderately long and depressed abdomen has all the tergites, with the exception of the first and the eleventh, longitudinally divided. The sclerites are indistinctly shagreened, and each tergite has along the hindmost margin about 30 rather short hairs in addition to one or two lateral and a single median hair in front of the row; "tactile" hairs are missing in the specimens examined.

*Antennæ*.—The *galea*, which is very powerful and almost twice as long as the terminal hair, is bifurcate, each branch again being strongly divided.

*Palps* (Pl. XXXI. fig. 33 a; text-fig. 81).—The palps are almost smooth or minutely granular, most distinctly on the inner surface of the femur and tibia; the fingers are not smooth but fairly distinctly granular. The hairs are long or moderately so; a number of long, slender, and completely simple ones are found on the dorsal tubercle of the tibia in addition to the usual long and slender ones of the posterior surfaces (*cf.* 18. p. 4). The *trochanter*, which is 1.5 as long as wide, is anteriorly very slightly convex and posteriorly produced into a prominent and somewhat rounded tubercle; dorsally it is prolonged into a deep, pointed protuberance (fig. 33 a) somewhat similar to that of the preceding species, but less suddenly attenuated terminally, less distinctly obtuse-angled proximally, and more moderately convex towards the end; it is much

Text-fig. 81.



*Ch. nodulimanus*  
Töm., ♂. Femur,  
tibia, and chela  
of right palp in  
posterior view.  
× 13.5.

deeper than wide, but less deep than the femur. The *femur* has a long and fairly well-defined stalk, beyond which it is scarcely attenuated towards the end. It is 2·3 as long as wide; its anterior outline is almost straight, while the posterior is strongly, but not very abruptly convex and then slightly so; the dorsal outline is first moderately convex and then towards the middle distinctly convex, being most raised just beyond the middle, rather steeply sloping into the terminal concavity; the femur is much deeper than broad. The *tibia*, which has a very long and fairly well-defined stalk, is distinctly longer and wider than the femur, and is 2·1 as long as broad; the anterior outline is first moderately convex, and then a trifle concave, while the posterior beyond the not very prominent condylus and elongated basal elevation is moderately concave and then distinctly convex; the ventral outline is almost semicircular distally and the dorsal one is distinctly produced, as the antero-dorsal surface is prolonged into a deep, conical, and somewhat rounded protuberance. The *chela*, which is 2·8 as long as deep, is scarcely 1·2 as broad as the trochanter is long; the *hand*, which is much longer and about 1·4 wider than the tibia, is 1·4 as long as wide, but scarcely 1·2 as long as deep, 1·3 as deep as wide, and about 1·3 as long as the fingers, which are 1·2 as long as the hand is wide but 1·1 shorter than the hand is deep, and which gape widely when closed; the lateral outlines of the hand are only slightly convex, while the ventral one is distinctly so, and the dorsal almost semicircular. Anteriorly both fingers possess at least ten *accessory* teeth, and posteriorly about fifteen. The immovable finger has posteriorly about eleven "*spots*" behind the basal tactile hairs, and eight in a longitudinal row beyond; posteriorly only a few are found (as seen in text-fig. 81).

*Coxæ*.—The fourth pair are almost exactly like those of *Ch. argentinus* Thor.

*Legs*.—The hairs are moderately long. The legs are very long and slender; the tibia of the first pair is 1·3 as long as the *tarsus*, which is 4·9 as long as deep; the *femur* of the fourth pair of legs is 3·1 as long as deep, scarcely longer than the tibia, and about half as deep as tarsus is long.

*Colour*.—The palps and the head are dark reddish brown, the thorax is yellowish brown, and the abdominal sclerites are dark brown. The legs have the anterior surface yellowish, but the posterior dark brown, a difference which is most marked in the first pair of legs, and which is also indicated in the preceding species.

*Measurements*.—Cephalothorax 2·2 (2·0); abdomen 3·75 (2·25) mm.

Palps: trochanter 1·104 (0·736); femur 1·840 (0·805); tibia 1·905 (0·920); hand 1·955 (1·265), depth 1·656; finger 1·541 mm.

Leg I.: femur 1·265 (0·345), trochantin 0·230 (0·391); tibia 1·150 (0·230); tarsus 0·782 (0·161) mm.

Leg IV.: femur 1·495 (0·475); tibia 1·505 (0·253); tarsus 0·920 (0·184) mm.

*Variation*.—One of the two specimens, a badly preserved one from Tobasis Kapa, was almost black, had the granulation of the cephalothorax more pronounced, and showed minor differences in the proportions of the palps and legs.

*Material*.—Of this species I have examined two specimens ( $\sigma$ ), the one found beneath the elytra of a specimen of *Acrocrinus longimanus* from Brazil and the other from Tobasis Kapa (Keyserling Coll.), both found in company with specimens of *Ch. macrochelatus* Töm. Ellingsen's specimen is from Brazil, found under exactly the same circumstances as the former of the above-mentioned; all other localities may, as shown by Ellingsen (*cf.* 18. p. 5), be regarded as doubtful.

*Remarks*.—Well-developed specimens ( $\sigma$ ) of this species can scarcely be confounded with any other form of Chelonethi on account of its powerful palps, with the peculiar shape of the dorsal tubercle of the trochanter and tibia, the long and slender stalks of femur and tibia, as well as by its exceedingly deep hand with the gaping fingers; but perhaps smaller animals are less easily distinguished from very large specimens of *Ch. macrochelatus* Töm., for instance that of which Balzan has given the measurements (11. p. 513)—perhaps Balzan has, like Daday (*cf.* 8. p. 173, and Ellingsen, 15. p. 154), confounded the two species. As regards the relation of the South-American species to Tömösváry's typical form from Dalmatia, I refer to Ellingsen's discussion (18. pp. 5–6).

48. CHELIFER CERVUS Balz. (Plate XXXI. figs. 34 *a-e*; text-fig. 82.)

1890. Balzan, (10) pp. 412–414, tav. xiii. figs. 2–2 *a*<sup>h</sup>.

1891. Balzan, (11) pp. 514 & 548, pl. 9. fig. 4 *b*.

1902. Ellingsen, (15) pp. 165–167.

*Male*.

*Cephalothorax*.—Large *ocular* spots rather indistinct. The cephalothorax, which is distinctly longer than broad, has two broad transverse *stripes*, of which the more prominent anterior one is curved backwards in the middle, while the posterior almost straight stripe is rather indistinct; in the middle in front of the anterior stripe a rather shallow longitudinal depression is observed. The integument of the head appears polished and is very minutely granular, but is behind the median transverse stripe smooth or almost so; the hairs are rather short.

*Abdomen*.—The fairly long and slender abdomen has all the tergites with the exception of the eleventh longitudinally divided, the first three are wider, but distinctly shorter than the following. The sclerites are almost smooth and the tergites bear along the hindmost margin from 14 to 20 moderately long (?) hairs, and the median tergites possess in addition to these two lateral and a single median hair in front of the row on each side; "tactile" hairs missing in examined specimen. The ventral surface behind the genital area was distinctly keeled, the two sclerites of each sternite making an acute angle with each other.

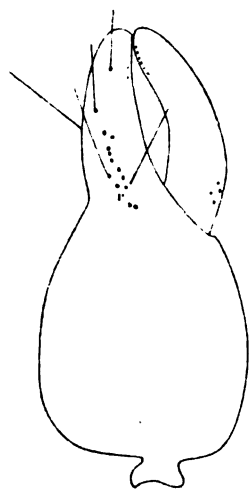
*Antennæ* (Pl. XXXI. fig. 34 *a*).—The *galea*, which extends distinctly beyond the terminal hair, is provided with a large number of branches as seen in figure.

*Palps* (Pl. XXXI. fig. 34 *b*; text-fig. 82).—The palps are almost smooth except



anteriorly, where they are minutely granular. The trochanter and the anterior surface of the femur are beset with a number of moderately long, stiff, and not completely simple hairs; the posterior surface of the femur and the tibia as well as the protuberance of the latter are densely covered—almost *shaggy*—with long, slender, and completely simple hairs; similar but shorter hairs cover the hand. The *trochanter*, which is almost 1.5 as long as wide, is anteriorly very slightly convex and posteriorly is produced into a fairly prominent and rounded basal tubercle; dorsally it is prolonged into a very deep, conical, obtusely pointed protuberance; observed from the front this protuberance is most similar to an acute-angled triangle, with the proximal margin slightly convex and the opposite a trifle concave; the trochanter is as deep as long and much deeper than the femur is. The *femur* has a rather short and well-defined stalk, beyond which it is attenuated towards the end. It is 2.2 as long as wide; the anterior outline beyond the stalk is almost straight, while the posterior is first rather abruptly convex and then slightly so; the dorsal outline beyond the stalk is abruptly convex and then very slightly so, with a fairly pronounced terminal concavity; the femur is distinctly deeper than wide. The *tibia*, which has a long and slender, not very well-defined stalk, is longer and wider than the femur, and is 2.3 as long as wide; anteriorly it is slightly convex, and posteriorly beyond the well-

Text-fig. 82.



*Ch. cervus* Balz., ♂.  
Chela of left palp in  
anterior view.  $\times 24$ .

marked condylus and fairly distinct basal elevation almost straight and then moderately convex; the ventral margin is almost circular, and the dorsal anterior surface is prolonged into a deep, rounded, somewhat conical protuberance. The *chela*, which is three times as long as deep, is 1.2 as broad as the trochanter is long; the *hand*, which is somewhat longer than, but 1.4 as wide as, the tibia, is 1.7 as long as wide but only 1.2 as long as deep, 1.4 as deep as broad, and scarcely 1.3 as long as fingers, which are almost 1.4 as long as hand is wide but a trifle shorter than it is deep, and which gape widely when closed; the lateral outlines are moderately convex, while the dorsal is very suddenly raised, being almost perpendicular on the stalk, and then slightly convex; the ventral margin is less suddenly raised and then almost straight. The marginal teeth are fairly well developed, where the fingers touch each other in their terminal fifth, but more proximally are very low or almost obsolete; *accessory* teeth were not observed posteriorly, but anteriorly the immovable finger has five and the movable seven

near to the tip. Anteriorly the immovable finger has about 15 "*spots*" and the movable four (*cf.* fig. 82), while the immovable posteriorly has seven spots.

*Coxæ*.—The second and third pair are more slender than the corresponding in the preceding species. The fourth pair are somewhat triangular, as the inner and hinder

margins, of which the former is a little longer, gradually merge into each other; the coxæ are scarcely widened out towards the extremity.

*Legs* (Pl. XXXI. figs. 34 *c-e*).—The hairs are moderately long and stiff, not quite simple; long, slender, completely simple hairs are placed dorsally at the tip of the femur, somewhat beyond the middle in the tibia, and one-fourth removed from the base in the tarsus, the latter at least as long as the distance to the end. The legs are moderately long and slender; the tibia of the first pair of legs is 1.3 as long as the *tarsus*, which is five times as long as deep; the *femur* of the fourth pair of legs is 2.8 as long as deep, 1.1 as long as tibia, and 1.7 lower than tarsus long. The *claws* show a remarkable structure; the posterior claw of the first pair is distinctly curved and pointed, but just beyond the middle is widened out to a large, somewhat rounded, and triangular process or tooth (fig. 34*d*); the anterior claw of the first pair, as well as both claws of the fourth pair, has a similar median, but somewhat posteriorly placed tooth (figs. 34 *c & e*).

*Colour*.—Palps and head reddish brown; the thorax is lighter brown and the tergal sclerites are yellowish brown.

*Measurements*.—Cephalothorax 1.38 (1.15); abdomen 2.75 (1.10) mm.

Palps: trochanter 0.690 (0.483); femur 1.265 (0.570); tibia 1.380 (0.610); hand 1.449 (0.851), depth 1.173; finger 1.150 mm.

Leg I.: femur 0.897 (0.299), trochantin 0.155 (0.322); tibia 0.775 (0.195); tarsus 0.574 (0.116) mm.

Leg IV.: femur 1.196 (0.425); tibia 1.081 (0.230); tarsus 0.713 (0.161) mm.

*Material*.—Of this species I have examined a single male from the Amazons; it has previously been recorded from Matto Grosso and Surinam.

*Remarks*.—The described form differs from Balzan's description by smaller size, by slightly different shape of galea (*cf.* 10. fig. 2 *a*), by the less produced posterior surface of the trochanter, and by the different proportions of the joints of the palps; the most important of these differences, namely that found in the very wide hand of the palps, which is much wider than the finger is long, is easily explained by the fact that he has measured the hand not in a true dorsal but in a partly lateral view. From Ellingsen's description it differs in points of even smaller importance; and consequently I regard the identification of the male from the Amazons with those from Matto Grosso and Surinam as beyond doubt.

This species shows in the very important character found in the claws of the legs similarity to the following species, but I nevertheless think that it is more nearly related to *Ch. nodulimanus* Töm. and allied species on account of the large galea, the structure of the head, and striking similarities in all the joints of the palps as well as in the legs. A rather remarkable dissimilarity is found in the structure of the tibia, if Ellingsen is right in the statement that its conical protuberance is equally well developed in the female and the male (*cf.* 15. p. 167).

## 49. CHELIFER DEPRESSIMANUS, sp. n. (Plate XXXI. figs. 35 a-d.)

*Female.*

*Cephalothorax*.—Rather indistinct *ocular* spots. The cephalothorax, which is distinctly longer than wide, has the anterior transverse *stripe* broad, almost straight, and fairly prominent, whilst the posterior is almost obsolete. The integument appears polished and is completely smooth with moderately long hairs.

*Abdomen*.—The very long slender abdomen has all the tergites with the exception of the first and the eleventh longitudinally divided, but not very distinctly so. The sclerites are smooth, and along the hindmost edge of each tergite is a row of about 14 moderately long hairs, in addition to one or two lateral and a single median hair in front of the row on each side; the "tactile" hairs were missing in the specimen examined.

*Antennæ*.—The moderately long, slender *galea*, which extends somewhat beyond the terminal hair, has six inferiorly placed teeth distally.

*Palps* (Pl. XXXI. figs. 35 a-b).—The palps are almost smooth except on the anterior surface, which is minutely and rather indistinctly granular. The long or moderately long hairs are stiff and not completely simple; long, slender, completely simple hairs are only observed posteriorly just behind the tip of the femur and in the middle of the tibia. The *trochanter*, which is 1.5 as long as wide, is anteriorly slightly convex and posteriorly produced into a rounded and rather low basal tubercle; dorsally it is prolonged into a not very deep, somewhat conical, and rounded protuberance; the trochanter is deeper than wide, but scarcely as deep as the femur. The *femur* has a short well-defined stalk, beyond which it is attenuated towards the end. It is twice as long as broad; the anterior outline is first slightly convex and then concave, while the posterior beyond the stalk is very abruptly convex, almost perpendicular, and then almost straight; the dorsal outline is almost exactly like the posterior. The *tibia*, which has a rather short but well-defined stalk, is a little longer and wider than the femur, and is 1.9 as long as wide; the anterior outline is very strongly convex, almost semicircular in the middle, and then a trifle concave, while the posterior beyond the prominent condylus and slightly marked basal elevation is almost straight and then strongly convex; the dorsal as well as the ventral outlines are moderately convex. The *chela*, which is 2.7 as long as wide, is almost 1.2 as broad as the trochanter is long; the *hand*, which is somewhat longer and about 1.3 as wide as the tibia, is 1.6 as long as wide but 1.9 as long as deep, 1.1 as wide as deep, and is 1.5 as long as the fingers, which are 1.1 as long as hand is wide, but 1.2 as long as it is deep, and do not gape when closed; the lateral outlines are moderately convex, while the dorsal and ventral are almost straight. Anteriorly each finger has a single accessory tooth, while

posteriorly each possesses a few in the distal third; the movable finger has only two spots anteriorly near to the base, while the immovable finger has five anteriorly, of which two are very large, two small (fig. 35 *b*), and one very large placed posteriorly.

*Coxæ*.—The coxæ are very similar to those of *Ch. argentinus* Thor. (*cf.* text-fig. 75); the fourth are trapezoidal, scarcely widened out towards the extremity, and with the inner and hinder margins, between which is a distinct obtuse angle, of almost equal length.

*Legs* (Pl. XXXI. figs. 35 *c-d*).—The hairs are rather short, with a long, slender, completely simple hair placed dorsally, somewhat beyond the middle of tibia IV., as well as one tarsal, one-fourth removed from the base and as long as the distance to the tip; the terminal dorsal one of femur IV. was not observed, but a long, not completely simple one is placed dorsally near the tip of the tibia. The legs are rather short and clumsy; the tibia of the first pair is 1.1 as long as the *tarsus*, which is four times as long as deep; the *femur* of the fourth pair of legs is 2.3 as long as deep, almost 1.2 as long as the tibia, and only 1.3 lower than the tarsus is long. The anterior *claw* of the first pair of legs has a rather small median tooth, and the posterior has a rather large triangular process (fig. 35 *c*), while the anterior claw (*ci*) of the fourth pair of legs has practically no tooth and the posterior has a rather big, somewhat triangular tooth (*cf.* fig. 35 *d, ce*).

*Colour*.—The palps and cephalothorax are reddish brown; and the tergal sclerites are dark brown.

*Measurements*.—Cephalothorax 0.690 (0.598); abdomen 2.185 (0.920) mm.

Palps: trochanter 0.335 (0.220); femur 0.552 (0.276); tibia 0.575 (0.310); hand 0.647 (0.391), depth 0.345; finger 0.437 mm.

Leg I.: femur 0.410 (0.144), trochantin 0.076 (0.152); tibia 0.296 (0.099); tarsus 0.266 (0.068).

Leg IV.: femur 0.524 (0.228); tibia 0.448 (0.132); tarsus 0.296 (0.084) mm.

*Material*.—Of this species I have examined a single badly preserved female from Uruguay (Keyserling Coll.).

*Remarks*.—This species shows in the shape of the palps great similarity to *Ch. ovatus* Balz. (*cf.* fig. 6, pl. 9, 11), but as it is much smaller, as the galea is much better developed, and as Balzan does not mention the presence of teeth in the claws, I do not hesitate in establishing my specimen as a new species. In the shape of the claws this species shows certainly greater similarity to *Ch. cervus* Balz. than to any other, but, nevertheless, I am not convinced that the two are nearly related to each other (*cf.* above).

## IV. Group of CHELIFER BIRMANICUS Thor.

*Femur of the first pair of legs with wide oblique articular cavity, with posterior condylus placed near ventral margin. Real eyes always wanting. Fingers of palps without accessory teeth. "Tactile" hair of tarsus IV. basal. Genital area of ♂ of birmanicus type.*

*(Claws as well as subterminal hair simple. Transverse grooves indistinct or wanting. Hairs pointed and almost simple; tibia of palps basally with a pair of long, slender, completely simple hairs. Flagellum consists of four hairs, and sexual difference is found in the galea.)*

I think that the two following species are naturally referred to the same group as *Ch. birmanicus* Thor. (cf. 20. p. 133), as they entirely agree with that species in structure with the exception of the genital area of the male, which in the badly preserved specimens of *Ch. nidificator* Balz. at least is less conspicuous than in *Ch. birmanicus* Thor. (cf. 20. p. 124, tab. iii. fig. 10 a), but nevertheless seems to be similar in important features. As seen from the above, only two species of those which Ellingsen refers to *Atemnus* Can. (cf. 18. p. 2) belong to this group, the other three are more naturally referred to the subgroup of *Ch. subrobustus* Balz.

*Synopsis of Species.*

- a. Trochanter not bigibbose; tibia with short stalk . . . . . 50. *Ch. nidificator* Balz.  
 b. Trochanter distinctly bigibbose; tibia with long and slender stalk . . . 51. *Ch. elongatus* Ell.

## 50. CHELIFER NIDIFICATOR Balz. (Plate XXXI. figs. 36 a-c; text-fig. 83.)

1890. Balzan, (10) pp. 417-418, tav. xiii. figs. 5-5 b.

1891. *Atemnus nidificator* Balzan, (11) pp. 510-511, pl. 9. fig. 1.

1902. Ellingsen, (15) pp. 146-148.

1905. Ellingsen, (18) p. 2.

1905. Ellingsen, (19) pp. 323-324.

1907. Tullgren, (23) p. 56.

*Male.*

*Cephalothorax.*—*Ocular* spots rather indistinct. The cephalothorax, which is scarcely longer than wide, has no transverse *grooves*, is smooth and provided with fairly long hairs.

*Abdomen.*—The fairly long slender abdomen has generally the tergites indistinctly divided with the exception of the first three and the last one; the division of the tergites is sometimes not complete, consisting of an anterior and a posterior incision separated in the middle; a similar incision may be observed in the second and third segments posteriorly as well. The sclerites are smooth, and the tergites possess along their hindmost margin from 8-12 long or very long, almost simple *hairs* placed within



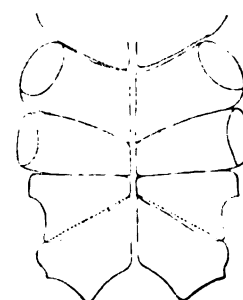
white spots; in front of the row a single hair is observed laterally, but none in the middle. The last two tergites each bear two pairs of very long and slender "tactile" hairs and so do the corresponding sternites. The genital area is very inconspicuous.

*Antennæ*.—The *galea*, which extends a little beyond the terminal hairs, is short and slender, with a few terminal teeth. The *flagellum* consists of four hairs, of which the longer anterior one is serrated, but with smaller teeth than in Balzan's figure 5 *b* (10).

*Palps* (Pl. XXXI. figs. 36 *a-b*).—The *maxillæ* are smooth and so are the palps, except part of the anterior surface, especially of the femur and tibia. The *hairs* are long and fairly long, stiff, and not completely slender; the following very long and slender completely simple hairs were observed, viz., three on the femur (two somewhat behind the tip, the one above the other, and the third posterior and terminal), two on the tibia above and below the basal elevation, and three at the base of the hand in a transverse row (one more dorsally placed and two more ventral). The *trochanter*, which is 1.5 as long as wide, is anteriorly slightly convex, and posteriorly produced into a rounded, not very pronounced tubercle; dorsally it is prolonged into a low, rounded, and slightly conical protuberance. The *femur* has a very short, well-defined stalk, beyond which it is suddenly enlarged and then distinctly attenuated towards the end. It is twice as long as broad; the anterior outline beyond the stalk is rather suddenly convex and then slightly concave, while the posterior, beyond the stalk, is very abruptly convex and then slightly so; dorsally the outline is first abruptly convex and then almost straight. The *tibia*, which has a very short and well-defined stalk, is longer and wider than the femur and is 1.9 as long as broad; anteriorly it is very strongly convex in the middle and a trifle concave terminally, while posteriorly, beyond the not very large condylus and insignificant basal elevation, it is for a short distance almost straight and then distinctly convex; the dorsal and ventral outlines are moderately convex. The *chela*, which is 2.7 as long as wide, is almost 1.3 broader than the trochanter is long; the *hand*, which is somewhat longer than, but 1.3 as wide as, the tibia, is 1.6 as long as wide, about 1.1 wider than deep, and 1.4 as long as the fingers, which are 1.1 as long as the hand is wide and do not gape when closed; the lateral outlines are slightly convex, while the dorsal and ventral ones are almost straight. No *accessory* teeth are observed; anteriorly four "*spots*" are observed between the three proximal "tactile" hairs (*cf.* fig. 36 *a*) in the immovable finger, but none in the movable finger; posteriorly a similar number is observed in the immovable as well as in the movable finger (*cf.* fig. 36 *b*).

*Coxæ* (text-fig. 83).—The second and the third pair are somewhat enlarged towards the end; the fourth pair are trapezoidal, scarcely widened out, and with the inner margin somewhat longer than the concave hinder one.

Text-fig. 83.



*Ch. nidificator* Balz.,  
♂. Coxæ.  $\times 44$ .

*Legs.*—The hairs, which are fairly long or long, are either completely simple or with a few terminal teeth; long and slender, completely simple hairs were missing except the tarsal “*tactile*” hair of the fourth pair, which is as long as the tarsus at least and one-tenth removed from the base, and the ventral ones of the trochanters and trochantins. The legs are rather short and clumsy; the trochantin of the first pair is much deeper than the femur proper, with a very wide articulate cavity, and its tibia is 1.1 as long as the *tarsus*, which is 3.5 as long as deep; the *femur* of the fourth pair of legs is 2.3 as long as deep, 1.3 as long as the tibia, and at least 1.2 lower than tarsus is long.

*Colour.*—Proximal joints of the palps are more yellowish brown and distal more reddish brown; the cephalothorax and tergal sclerites are brown or yellowish brown.

*Measurements.*—Cephalothorax 0.805 (0.790); abdomen 2.30 (0.920) mm.

Palps: trochanter 0.391 (0.253); femur 0.690 (0.345); tibia 0.713 (0.375); hand 0.805 (0.495), depth 0.437; finger 0.552 mm.

Leg I.: femur 0.494 (0.182), trochantin 0.091 (0.205); tibia 0.380 (0.133); tarsus 0.325 (0.095) mm.

Leg IV.: femur 0.765 (0.334); tibia 0.600 (0.205); tarsus 0.410 (0.129) mm.

#### *Female.*

*Antennæ.*—The *galea*, which extends beyond the terminal hair, is fairly long and slender, with about six terminal teeth, as figured by Balzan (10. fig. 56 a).

*Palps.*—The *femur* and the *tibia* are comparatively less slender, being 1.9 and 1.8 respectively as long as wide; the *hand* is 1.7 as long as wide, distinctly 1.1 as wide as deep, and 1.5 as long as fingers.

*Legs.*—The legs are less slender, the *femur* of the fourth pair of legs 2.2 as long as deep, 1.2 as long as the tibia, and scarcely 1.2 lower than tarsus is long.

*Measurements.*—Cephalothorax 0.920 (0.920); abdomen 3.22 (1.495) mm.

Palps: trochanter 0.414 (0.276); femur 0.736 (0.391); tibia 0.759 (0.414); hand 0.897 (0.529), depth 0.460; finger 0.598 mm.

Leg I.: femur 0.517 (0.213), trochantin 0.095 (0.228); tibia 0.403 (0.144); tarsus 0.334 (0.099).

Leg IV.: femur 0.798 (0.357); tibia 0.646 (0.213); tarsus 0.418 (0.137) mm.

*Material.*—Of this species I have examined five males and five females, of which one carried a large bundle of eggs, as well as two young ones, collected by the Danish ‘Galathea’ Expedition in Bahia, a single male sifted by Dr. Meinert in the month of August at La Moka, and one collected by M. Simon in St. Vincent; besides these, a female, collected in Guatemala by Dr. Stoll, and a male from Tobasis Kapa were examined. This species has previously been recorded from Venezuela, Ecuador, Brazil, Paraguay, Argentine, and Haiti.

*Remarks.*—This species, of which the small specimens (var. *minor* Balz.) examined were exactly like one determined by Mr. Ellingsen, is easily distinguished from all other South-American species by the shape of the palps.

51. CHELIFER ELONGATUS Ell. (Plate XXXI. figs. 37 *a-g*; text-fig. 84.)  
1902. Ellingsen, (15) pp. 149–151.

*Female.*

*Cephalothorax.*—*Ocular* spots indistinct. The *cephalothorax*, which is distinctly longer than wide, has no transverse grooves, is smooth and provided with fairly long hairs.

*Abdomen.*—The fairly long slender abdomen has all the tergites, with the exception of the first and eleventh, more or less distinctly divided longitudinally. The tergites have the sclerites smooth, and possess along their hindmost margin about ten moderately long hairs in addition to four (six?) in front of the row; tip of the abdomen with tactile hairs.

*Antennæ.*—The *galea*, which extends very much beyond the terminal hair, is fairly long and slender and is provided with about six short branches in the distal third. The *flagellum* consists of four hairs, of which the anterior has about ten longer and shorter teeth along the front margin.

*Palps* (Pl. XXXI. figs. 37 *a-f*).—The *maxillæ* are smooth and so are the palps, with the exception of the posterior surface of the trochanter and the anterior of the three following joints, which are more or less distinctly granular. The fairly long and long hairs are stiff and not completely simple; long, slender, and completely simple hairs are placed posteriorly in the middle and at the tip of the femur, posteriorly at the base of the tibia, one above and one below the basal elevation, and posteriorly at the base of the hand at least a single one; the hand has ventrally between the base and the insertion of the finger a single hair (fig. 37 *d*). The *trochanter*, which is 1.5 as long as wide, is anteriorly slightly convex, almost straight, and posteriorly is produced into a rounded, fairly long tubercle; dorsally it is prolonged into a somewhat conical and fairly deep protuberance; the trochanter is somewhat deeper than wide, but not as deep as the femur is. The *femur* has a short, well-defined stalk, beyond which it is slightly attenuated towards the end. It is 2.2 as long as deep; the anterior outline is slightly convex and then concave, while the posterior is rather abruptly convex and then almost straight; dorsally the outline is first abruptly convex and then completely straight; the femur is about as deep as wide. The *tibia*, which has a long, slender, fairly well-defined stalk, is longer and wider than the femur, and is twice as long as broad; anteriorly it is very strongly convex, almost semicircular, and then terminally almost straight, while posteriorly, beyond the prominent condylus and well-marked basal elevation, it is slightly concave and then strongly convex; the dorsal outline is strongly

convex, while the ventral is moderately so. The *chela*, which is 2·7 as long as wide, is about 1·2 as broad as the trochanter is long; the *hand*, which is longer and 1·3 as wide as the tibia, is 1·7 as long as wide, scarcely as wide as deep, and 1·6 as long as the fingers, which are only a trifle longer than the hand is wide; the lateral outlines are slightly convex, while the dorsal and ventral ones are almost straight. The immovable finger possesses anteriorly seven proximal “spots” in a longitudinal row, while the movable has none (figs. 37 *e-f*), and posteriorly the immovable finger has two “spots” and the movable a single one.

*Coxæ*.—The second and third pair are like those of the preceding species (*cf.* text-fig. 83), while the fourth are of a more triangular appearance with the inner and hinder margins, of which the former is much the longer, gradually merging into each other.

*Legs*.—The fairly long or rather short hairs are generally more or less stiff and not quite simple; the femur has dorsally a terminal, long, slender, completely simple hair; the tarsal “*tactile*” one is one-tenth removed from the base and at least as long as the tarsus. The legs are moderately long and slender; the tibia of the first pair is 1·2 as long as the *tarsus*, which is 4·3 as long as deep; the *femur* of the fourth pair is 2·4 as long as deep, 1·2 as long as tibia, and 1·2 lower than the tarsus is long.

*Colour*.—The palps are reddish brown and the cephalothorax as well as the tergal sclerites are pale yellowish brown; the rest of body more or less yellowish.

*Measurements*.—Cephalothorax 0·805 (0·690); abdomen 3·56 (1·49) mm.

Palps: trochanter 0·368 (0·253); femur 0·640 (0·285); tibia 0·667 (0·335); hand 0·713 (0·425), depth 0·437; finger 0·450 mm.

Leg I.: femur 0·456 (0·160), trochantin 0·091 (0·175); tibia 0·365 (0·106); tarsus 0·299 (0·072) mm.

Leg IV.: femur 0·631 (0·266); tibia 0·540 (0·152); tarsus 0·329 (0·091) mm.

*Variation*.—Another female mounted with the above mentioned was much paler and had the hairs of the comparatively short abdomen well preserved; along the hindmost margin twelve hairs in addition to six in front of the row in the median tergites; the tenth and last tergites as well as the corresponding sternites with two pairs of tactile hairs each. The palps were somewhat less slender, but in the main as described.

#### *Male.*

*Abdomen &c.*—The abdomen is exceedingly long and slender, the *galea* scarcely extends beyond the terminal hair, and the teeth are wanting or obsolete.

*Palps* (Pl. XXXI. fig. 37 *g*).—The *trochanter* is much more distinctly bigibbose than in the female, as the posterior tubercle is much longer and more conical and as the dorsal protuberance is very deep and conical. The *femur*, which is 2·3 as long as wide, is almost straight anteriorly, and posteriorly less abruptly convex. The *tibia*, which has an exceedingly long slender stalk, is 1·9 as long as wide; the anterior

outline is much more strongly convex than in the female, and the posterior beyond the basal elevation is very distinctly concave and then more strongly convex than in the female (fig. 37 g). The *chela* is only a trifle broader than the trochanter is long; the *hand*, which is only 1.2 as wide as the tibia, is 1.5 as long as the fingers, which are 1.1 as long as hand is wide. The immovable finger has anteriorly only six "spots," less regularly arranged.

*Colour*.—The palps are dark reddish brown, the cephalothorax is brown, and the abdominal sclerites are almost olive-coloured, and consequently there is no sharp difference between a pale body and dark palps.

*Measurements*.—Cephalothorax 0.690 (0.575); abdomen 2.07 (0.69) mm.

Palps: trochanter 0.368 (0.253); femur 0.690 (0.299); tibia 0.690 (0.355); hand 0.690 (0.405), depth 0.415; finger 0.455 mm.

*Material*.—Of this species I have examined two females collected by Mr. Jessen at (?) Essequibo; it has previously been recorded from Ecuador.

*Remarks*.—The male of this species, which I was able to examine by the kindness of Mr. Ellingsen, does not differ from the original description except in a single character; Ellingsen writes: "La main presque deux fois plus longue . . . que le femur," while the animal has the hand about as long as the femur; this mistake was caused perhaps by a slip of the pen or by an error of the printer. That the female described belongs to the same species as the male, is not quite certain. The differences between them in the shape of the body as well as in the structure of the trochanter and tibia, &c., are certainly striking, but not so great that they cannot easily be explained as sexual ones; consequently I should not think myself justified in establishing a new species. About similarity to *Ch. navigator* With, cf. 22. p. 63.

*Variation*.—In addition to the specimens mentioned I have examined a much larger female, collected in a loaf on board the Danish ship 'Galathea' in January 1847, which I feel obliged to refer to the same species, as it only differed in mere trivialities. The *trochanter* has protuberances somewhat longer (text-fig. 84) and is deeper than the femur; the *tibia* is less strongly convex anteriorly and more distinctly concave posteriorly beyond the basal elevation. The *tarsus* of the first pair of legs is only four times as long as deep; the *femur* of the fourth pair of legs is 2.5 as long as deep, 1.3 as long as the tibia, and 1.3 lower than the tarsus is long.

*Measurements*.—Body somewhat shorter and less slender; the trochanter of the palps 0.506 (0.322); femur 0.875 (0.405); tibia 0.897 (0.437); hand 0.897 (0.552), depth 0.575; finger 0.585 mm.

Text-fig. 84.



*Ch. elongatus* Ell.,  
var., ♀. Trochanter  
of left palp in anterior  
view. × 44.



The following four South-American species will certainly always remain *nomina nuda*, if the original specimens do not exist. Not even the papers in which they are described are known to me:—

52. CHELIFER COECUS Gerv.

1849. *Chelanops coecus* Gervais, (1) p. 13, pl. i. fig. 13.

53. CHELIFER CIMEX Gerv.

1849. Gervais, (1).

54. CHELIFER EXCENTRICUS Holmb.

1874. Holmberg, (2 a) p. 299, pl. vi. fig. 6.

55. CHELIFER TIMIDUS Holmb.

1876. Holmberg (2 b).

#### LITERATURE.

An asterisk indicates that the book in question was not at my disposal; that I am able to include the pagination &c. of these papers is due to the kind assistance of Mr. A. S. Hirst; only the title of the paper numbered 2 b may be regarded as doubtful (*cf.* Balzan, 10).

- 1.\* P. GERVAIS in C. GAY—Historia física y política de Chile. Zoología, iv. (1849). "Arachnidos quelifereos," pp. 10–13, pl. i. fig. 13.
- 2 a.\* E. L. HOLMBERG.—"Descriptions et notices d'Arachnides de la République Argentine." Period. Zool. Argent. 1874, i. pp. 283–302, pl. vi.
- 2 b.\* E. L. HOLMBERG.—"Arachnidos Argentinos." An. de Agricultura Buenos Aires, t. iv. (1876).
- 3.\* T. THORELL.—"Sobre algunos Arachnidos de la republica Argentine." Period. Zool. Argent. 1875, ii. pp. 201–218.
4. Ö. TÖMÖSVÁRY.—"Pseudoscorpiones Faunæ Hungaricæ. A Magyar Fauna Alskorpiói." Magyar tudományos Akadémia Math. és Természettud Közlemények. Budapest, vol. xviii. (1882) pp. 135–256, tab. i.–iv.
5. Ö. TÖMÖSVÁRY.—"Adatok az Alskorpiók ismeretéhez." Termés. Füzetek, vol. viii. (1884) pp. 16–27, tab. i.
- 6.\* E. SIMON.—"Arachnides rec. par la Mission du Cap Horn." Mission scientifique du Cap Horn, 1882–1883. T. vi. Zoologie. Paris (1887), 42 pp.
- 7.\* L. BALZAN.—Chernetidæ nonnullæ Sud-Americanæ. Asuncion, Paraguay, pug. i.–ii. 1887; pug. iii. 1888 (no pagination).
8. E. v. DADAY.—"Übersicht der Chernetiden des ungarischen Nationalmuseums in Budapest." Termés. Füz. vol. xi. (1889) pp. 165–192, tab. iv.
9. E. v. DADAY.—"Egy braziliai új Álskorpiógaj a magyar nemzeti museum állattárában." Termés. Füz. vol. xii. (1889).

10. L. BALZAN.—“Revisione dei Pseudoscorpioni del Bacino dei Fiumi, Parana e Paraguay nell' America meridionale.” *Ann. Mus. Civico Stor. natur. Genova*, ser. 2, vol. ix. (1890) pp. 401-454, tavv. xiii.-xvii.
11. L. BALZAN.—“Chernetes (Pseudoscorpiones). Voyage de M. E. Simon au Venezuela.” *Ann. Soc. Ent.* vol. lx. (1891) pp. 497-552, pls. 9-12.
12. E. SIMON.—“Arachnides rec. à la Terre de Feu par C. Backhausen.” *Anales del Musco Nacional de Buenos Aires*, t. iv. (1895) pp. 167-172.
13. A. TULLGREN.—“Two new Species of Chelonethi (Pseudoscorpions) from America.” *Entomologisk Tidskrift*, Stockholm (1900), pp. 153-156, figs. 1-2.
- 14.\* E. SIMON.—Hamburger magalhaensische Sammelreise: Arachnoideen. Hamburg (1902), 47 pp. (Pseudoscorpiones, p. 44).
15. E. ELLINGSEN.—“Sur la Faune de Pseudoscorpions de l'Equateur.” *Mém. Soc. Zool. France*, t. xv. (1902) pp. 146-168. ;
16. E. ELLINGSEN.—“On some Pseudoscorpions from Patagonia collected by Dr. F. Silvestri.” *Boll. Mus. Zool. ed Anat. comp. di Torino*, vol. xix. n. 480 (1904), pp. 1-7.
17. E. ELLINGSEN.—“Pseudoscorpiones viaggio dell Dr. Enrico Festa nell' Ecuador e regioni Vicine. XIX.” *Boll. Mus. Zool. ed Anat. comp. di Torino*, vol. xx. n. 497 (1905), pp. 1-3.
18. E. ELLINGSEN.—“Pseudoscorpions from South America collected by Dr. A. Borelli, A. Bertoni de Winkelried, and Prof. Goeldi.” *Boll. Mus. Zool. ed Anat. comp. di Torino*, vol. xx. n. 500 (1905), pp. 1-17.
19. E. ELLINGSEN.—“On some Pseudoscorpions from South America in the Collection of Prof. Dr. F. Silvestri.” *Zool. Anz.*, Bd. xxix. No. 10 (1905), pp. 323-328.
20. C. J. WITH.—“III. Chelonethi. An Account of the Indian False-Scorpions, together with Studies on the Anatomy and Classification of the Order.” *The Danish Expedition to Siam, 1899-1900. D. Kgl. Danske Vidensk. Selsk. Skrifter*, 7 Række, Naturvidenskab. og Mathem. Afd. iii. 1 (1906), pp. 1-214, figs. 1-24, tab. i.-iv.
21. C. J. WITH.—“On Chelonethi, chiefly from the Australian Region, in the Collection of the British Museum, with Observations on the Coxal Sac and on some Cases of Abnormal Segmentation.” *Ann. Mag. Nat. Hist.* (7) xv. (1905) pp. 94-143, pls. vi.-x.
22. C. J. WITH.—“On some New Species of *Cheliferinæ* Hans. and *Garypidæ* Hans. in the British Museum.” *Journ. Linn. Soc., Zool.* vol. xxx. (London, 1907), pp. 49-85, pls. 8-10.
23. A. TULLGREN.—“Sur Kenntnis Aussereuropäischer Chelonethiden des Naturhistorischen Museums in Hamburg.” *Mitteilungen aus dem Naturhistorischen Museum*, xxiv. (1907) pp. 21-75, taf. i-v.
24. A. TULLGREN.—Über einige exotische Chelonethiden.” *Entomologisk Tidskrift*, Stockholm (1908), pp. 57-64.

PLATE XXIX.

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## PLATE XXIX.

1. *Chelifer imperator*, sp. n.

- Fig. 1 *a.* ♂. Left side of abdomen observed from beneath in a somewhat oblique position,  $\times 24$ : 1, first abdominal tergite; 10, tenth abdominal tergite.
- 1 *b.* ♂. Lower surface of anterior portion of body, showing widely gaping genital opening,  $\times 33$ : *o*, entrance-opening to coxal sac; *s*, coxal spine; *st'*, first stigma; *r*, ram's-horn-shaped organ, the left part of which extends somewhat beyond opening.
- 1 *c.* ♂. Left palp,  $\times 13.5$ .
- 1 *d.* ♂. Left chela in anterior view,  $\times 24$ .
- 1 *e.* ♂. Left leg I. in anterior view,  $\times 33$ .
- 1 *f.* ♂. Tip of left leg I. in anterior view,  $\times 200$ : *hi*, anterior subterminal hair; *he*, posterior subterminal hair; *ci*, anterior claw; *ce*, posterior claw.
- 1 *g.* ♀. Left palp,  $\times 17.5$ .
- 1 *h.* ♀. Right chela in posterior view,  $\times 24$ .
- 1 *i.* ♀. Two posterior pairs of coxæ,  $\times 33$ .

2. *Chelifer rex*, sp. n.

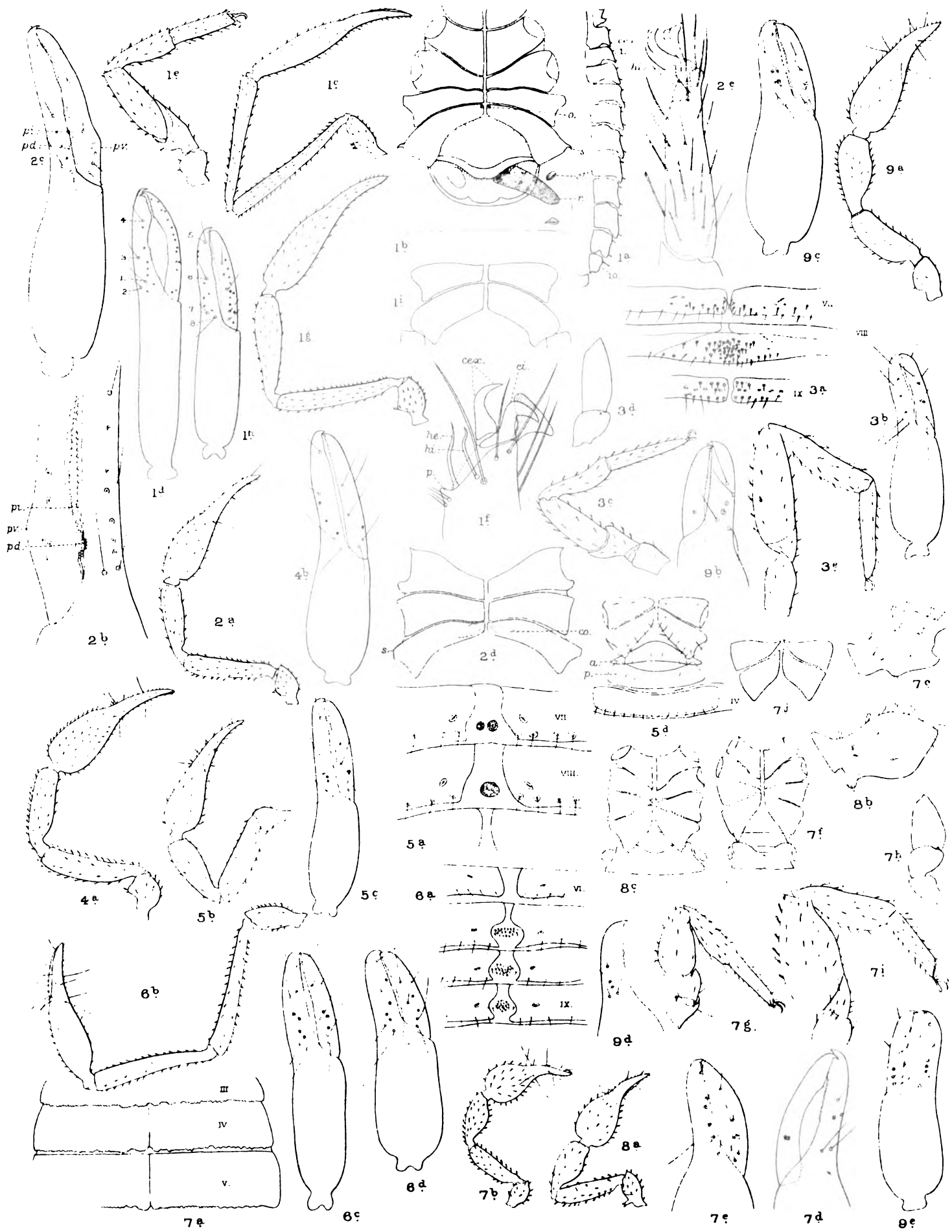
- Fig. 2 *a.* ♂. Left palp,  $\times 17.5$ .
- 2 *b.* ♂. Right chela of palps in almost anterior view,  $\times 77$ : *pd*, *pv*, and *pi*, cf. text.
- 2 *c.* ♂. Right chela of palps in almost posterior view,  $\times 44$ .
- 2 *d.* ♂. Coxæ,  $\times 44$ : *s*, rudiment of coxal spine; *co*, coxal sac.
- 2 *e.* ♂. Left tarsus of first pair in anterior view,  $\times 117$ : *hi*, anterior subterminal hair; *ce*, posterior claw.

3. *Chelifer rufus* Balz.

- Fig. 3 *a.* ♂. Seventh to ninth sternites showing spinous areas,  $\times 77$ : VII.-IX., corresponding sternites.
- 3 *b.* ♂. Right chela in posterior view,  $\times 44$ .
- 3 *c.* ♂. Left leg I. in anterior view,  $\times 57$ .
- 3 *d.* ♂. Femur of left leg I. in posterior view,  $\times 57$ .
- 3 *e.* ♂. Left leg IV. in anterior view,  $\times 57$ .

4. *Chelifer nobilis*, sp. n.

- Fig. 4 *a.* ♂. Left palp,  $\times 24$ .
- 4 *b.* ♂. Right chela,  $\times 44$ .



C.J. With, del.

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SOUTH AMERICAN CHELIFERINÆ.





5. *Chelifer canestrinii* Balz.

- Fig. 5 a. ♂. The seventh and eighth sternites,  $\times 115$ : VII. and VIII., corresponding sternites.  
 5 b. ♂. Left palp,  $\times 30$ .  
 5 c. ♂. Right palp in posterior view,  $\times 44$ .  
 5 d. ♂. Coxæ and sexual area: *a* and *p*, anterior and posterior plates; IV., fourth sternite.

6. *Chelifer longichelifer* Balz.

- Fig. 6 a. ♂. Sixth to ninth sternites,  $\times 77$ : VI. and IX., corresponding sternites.  
 6 b. ♂. Left palp,  $\times 20$ .  
 6 c. ♂. Right chela in posterior view,  $\times 44$ .  
 6 d. ♀. Right chela in posterior view,  $\times 44$ .

7. *Chelifer segmentidentatus* Balz.

- Fig. 7 a. ♂. The third to the fifth abdominal tergites,  $\times$  c. 80: III.–V., corresponding tergites.  
 7 b. ♂. Left palp,  $\times 24$ .  
 7 c. ♂. Trochanter of left palp from below,  $\times 77$ .  
 7 d. ♂. Right chela in anterior view,  $\times$  c. 50.  
 7 e. ♂. Right chela in posterior view,  $\times$  c. 50.  
 7 f. ♂. Coxæ and sexual area,  $\times 44$ .  
 7 g. ♂. Left leg I. in anterior view,  $\times 57$ .  
 7 h. ♂. Femur of left leg I. in posterior view,  $\times 57$ .  
 7 i. ♂. Left leg IV. in anterior view,  $\times 57$ .  
 7 j. ♀. Last two pairs of coxæ,  $\times 44$ .

8. *Chelifer satanas*, sp. n.

- Fig. 8 a. ♂. Left palp,  $\times 24$ .  
 8 b. ♂. Trochanter of left palp from below,  $\times 77$ .  
 8 c. ♂. Coxæ and genital area,  $\times 44$ .

9. *Chelifer insignis*, sp. n.

- Fig. 9 a. ♀. Left palp,  $\times 24$ .  
 9 b. ♀. Right chela in anterior view,  $\times 44$ .  
 9 c. ♀. Right chela in posterior view,  $\times 44$ .  
 9 d. ♀ var. Left chela in anterior view,  $\times 35$ .  
 9 e. ♀ var. Left chela in posterior view,  $\times 35$ .



PLATE XXX.

## PLATE XXX.

10. *Chelifer rudis* Balz.

- Fig. 10 *a.* ♂. Left chela in anterior view,  $\times 24$ .  
10 *b.* ♂. Left chela in posterior view.  
10 *c.* ♀. Cucullus,  $\times 44$ .  
10 *d.* ♀. Right palp,  $\times 13.5$ .  
10 *e.* ♀. Coxæ,  $\times 24$ .  
10 *f.* ♀. Left leg I. in anterior view,  $\times 33$ .

11. *Chelifer subgracilis*, sp. n.

- Fig. 11 *a.* ♀. Left palp,  $\times 17.5$ .  
11 *b.* ♀. Right chela in anterior view,  $\times 33$ .

12. *Chelifer subrobustus* Balz.

- Fig. 12 *a.* ♀? Left chela in anterior view,  $\times 44$ .  
12 *b.* ♀? Left chela in posterior view,  $\times 44$ .

13. *Chelifer antillarum*, sp. n.

- Fig. 13 *a.* ♀. Left palp,  $\times 44$ .  
13 *b.* ♀. Right chela in exterior view,  $\times 77$ .

14. *Chelifer subrudis* Balz.

- Fig. 14 *a.* ♀. Flagellum and three basal teeth of serrula,  $\times 200$ .  
14 *b.* ♀. Left palp,  $\times 17.5$ .  
14 *c.* ♀. Chela and tibia of right palp in anterior view,  $\times 17.5$ .  
14 *d.* ♀. Right coxa IV.,  $\times 44$ .  
14 *e.* ♀. Left leg I. in anterior view,  $\times 29$ .  
14 *f.* ♀. Left leg IV. in posterior view,  $\times 29$ .

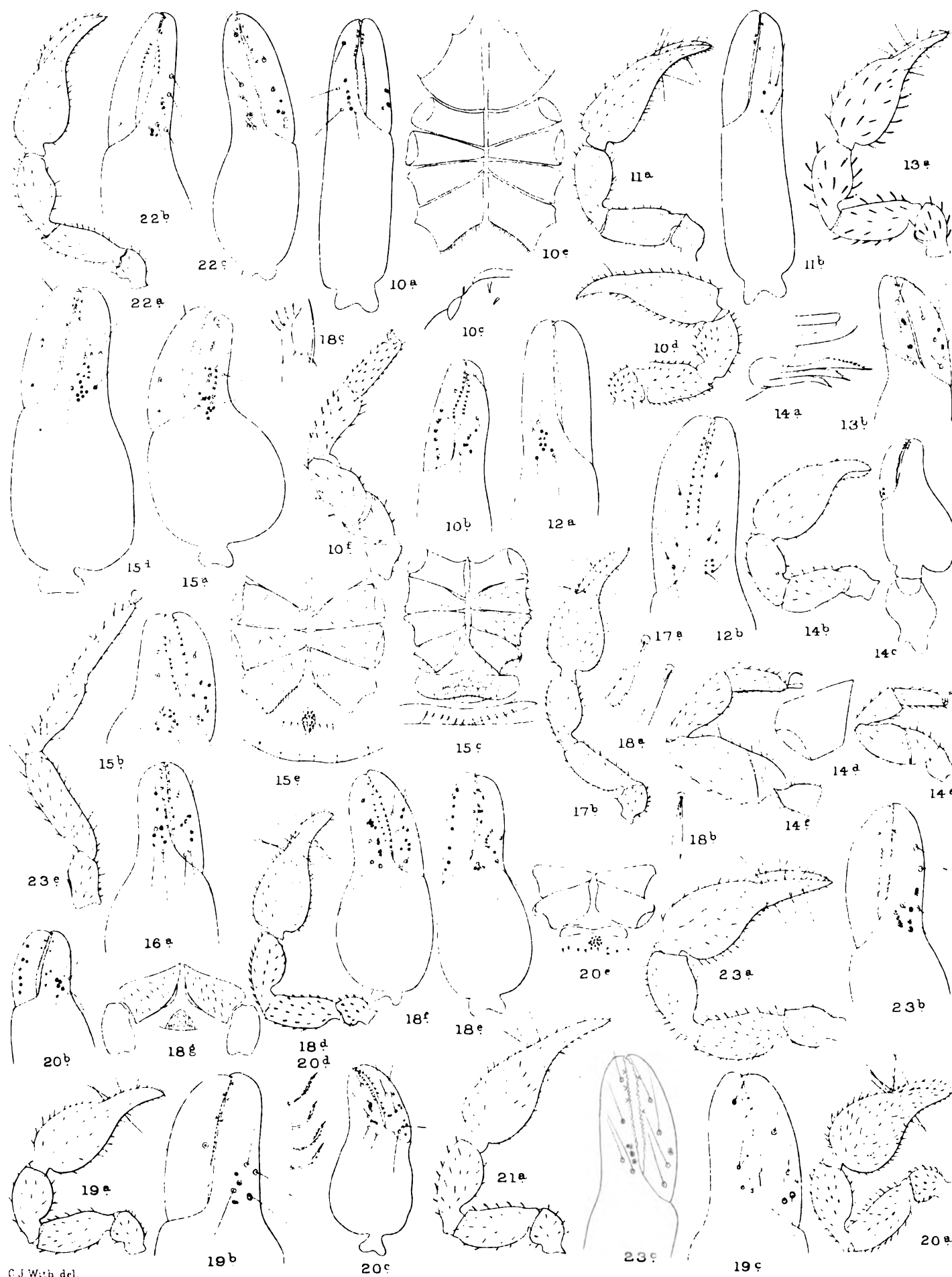
15. *Chelifer bicolor* Balz.

- Fig. 15 *a.* ♂. Chela of right palp in anterior view,  $\times 44$ .  
15 *b.* ♂. Chela of right palp in posterior view,  $\times 44$ .  
15 *c.* ♂. Coxæ and genital area,  $\times 28$ .  
15 *d.* ♀. Chela of right palp in posterior view,  $\times 44$ .  
15 *e.* ♀. Coxæ and genital area,  $\times 28$ .

16. *Chelifer albomaculatus* Balz.

- Fig. 16 *a.* ♂. Chela of right palp in posterior view,  $\times 44$ .





C. J. With, del.

Not to scale

SOUTH AMERICAN CHELIPERINAE.



17. *Chelifer crassimanus* Balz.Fig. 17 *a.* ♀. Hair of tenth tergite,  $\times 200$ .17 *b.* ♀. Left palp,  $\times 17.5$ .18. *Chelifer meinertii*, sp. n.Fig. 18 *a.* ♀. Hair of tenth abdominal tergite,  $\times 200$ .18 *b.* ♀. Hair of eleventh abdominal tergite,  $\times 200$ .18 *c.* ♀. Left galea,  $\times 200$ .18 *d.* ♀. Left palp,  $\times 24$ .18 *e.* ♀. Chela of right palp in anterior view,  $\times 44$ .18 *f.* ♀. Chela of right palp in posterior view,  $\times 44$ .18 *g.* ♀. Fourth pair of coxæ,  $\times 44$ .19. *Chelifer subrotundatus* Balz.Fig. 19 *a.* ♀. Left palp,  $\times 44$ .19 *b.* ♀. Chela of right palp in anterior view,  $\times 77$ .19 *c.* ♀. Chela of right palp in posterior view,  $\times 77$ .20. *Chelifer plumosus*, sp. n.Fig. 20 *a.* ♀. Left palp,  $\times 33$ .20 *b.* ♀. Chela of right palp in anterior view,  $\times 44$ .20 *c.* ♀. Chela of right palp in posterior view,  $\times 44$ .20 *d.* ♀. Hairs of anterior surface of hand,  $\times 110$ .20 *e.* ♀. Fourth pair of coxa and genital area,  $\times 44$ .21. *Chelifer nitidimanus* Ell.Fig. 21 *a.* ♀. Left palp,  $\times 44$ .22. *Chelifer michaelsenii* Sim.Fig. 22 *a.* ♂. Left palp,  $\times 24$ .22 *b.* ♂. Chela of right palp in anterior view,  $\times 44$ .22 *c.* ♂. Chela of right palp in posterior view,  $\times 44$ .23. *Chelifer celerrimus*, sp. n.Fig. 23 *a.* ♀. Left palp,  $\times 44$ .23 *b.* ♀. Chela of right palp in anterior view,  $\times 77$ .23 *c.* ♀. Chela of right palp in posterior view,  $\times 77$ .23 *d.* ♀. Left leg IV. in anterior view,  $\times 57$ .



PLATE XXXI.

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## PLATE XXXI.

23. *Chelifer celerrimus*, sp. n.

Fig. 23 *d.* ♀. Left leg I. in anterior view,  $\times 57$ .

24. *Chelifer* sp. Young.

Fig. 24 *a.* Chela of right palp in posterior view,  $\times 44$ .

25. *Chelifer ellingsenii*.

Fig. 25 *a.* ♀. Left palp,  $\times 17\cdot5$ .

25 *b.* ♀. Chela of right palp in anterior view,  $\times 44$ .

25 *c.* ♀. Chela of right palp in posterior view,  $\times 44$ .

25 *d.* ♀. Left leg I. in anterior view,  $\times 33$ .

25 *e.* ♀. Left leg IV. in posterior view,  $\times 33$ .

26. *Chelifer subovatus*, sp. n.

Fig. 26 *a.* ♂. Left palp,  $\times 17\cdot5$ .

26 *b.* ♂. Trochanter and femur of right palp in anterior view,  $\times 24$ .

26 *c.* ♂. Chela of left palp in anterior view,  $\times 24$ .

26 *d.* ♂. Chela of right palp in posterior view,  $\times 24$ .

26 *e.* ♀. Left palp,  $\times 17\cdot5$ .

26 *f.* ♀. Trochanter and femur of left palp in anterior view,  $\times 24$ .

27. *Chelifer intermedius* Balz.

Fig. 27 *a.* ♂. Trochanter and femur of right palp in anterior view,  $\times 24$ .

27 *b.* ♂. Left tibia of palp,  $\times 24$ .

27 *c.* ♂. Chela of right palp in anterior view,  $\times 24$ .

27 *d.* ♂. Tibia and chela of right palp in posterior view,  $\times 24$ .

28. *Chelifer communis* Balz.

Fig. 28 *a.* ♂. Trochanter and femur of right palp in anterior view,  $\times 24$ .

28 *b.* ♂. Tibia of left palp,  $\times 24$ .

28 *c.* ♂. Tibia and chela of right palp in posterior view,  $\times 24$ .

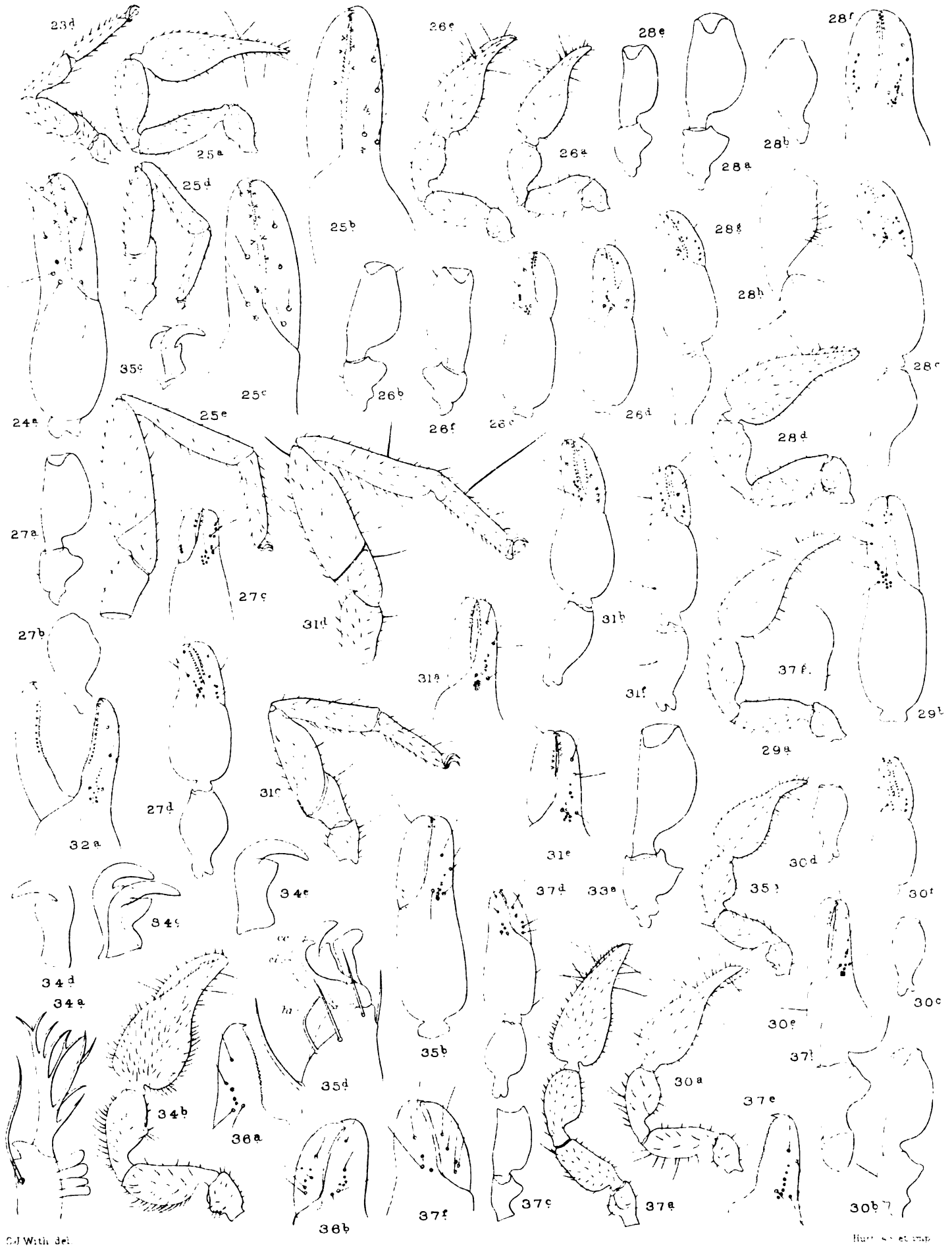
28 *d.* ♀. Left palp,  $\times 24$ .

28 *e.* ♀. Trochanter and femur of right palp in anterior view,  $\times 24$ .

28 *f.* ♀. Fingers of right palp in anterior view,  $\times 44$ .

28 *g.* ♀. Tibia and chela of right palp in posterior view,  $\times 24$ .

28 *h.* ♂. Ellingsen's original specimen. Tibia of left palp,  $\times 24$ .



SOUTH AMERICAN CHELIFERINAE



29. *Chelifer nitidus* Ell.

- Fig. 29 *a.* ♀. Left palp,  $\times 24$ .  
 29 *b.* ♀. Chela of left palp in anterior view,  $\times 37$ .

30. *Chelifer similis* Balz.

- Fig. 30 *a.* ♂. Left palp,  $\times 17.5$ .  
 30 *b.* ♂. Trochanter and femur of right palp in anterior view,  $\times 24$ .  
 30 *c.* ♂. Tibia of right palp in posterior view,  $\times 17.5$ .  
 30 *d.* ♂. Tibia of right palp in posterior, partly dorsal view,  $\times 17.5$ .  
 30 *e.* ♂. Chela of right palp in anterior view,  $\times 24$ .  
 30 *f.* ♂. Chela of right palp in posterior view,  $\times 17.5$ .

31. *Chelifer argentinus* Thor.

- Fig. 31 *a.* ♂. Fingers of right palp in anterior view,  $\times 24$ .  
 31 *b.* ♂. Tibia and chela of right palp in posterior view,  $\times 17.5$ .  
 31 *c.* ♂. Left leg I. in anterior view,  $\times 37$ .  
 31 *d.* ♂. Left leg IV. in anterior view,  $\times 37$ .  
 31 *e.* ♀. Fingers of right palp in anterior view,  $\times 24$ .  
 31 *f.* ♀. Tibia and chela of right palp in posterior view,  $\times 24$ .

32. *Chelifer macrochelatus* Töm.

- Fig. 32 *a.* ♂. Fingers of right palp in anterior view,  $\times 24$ .

33. *Chelifer nodulimanus* Töm.

- Fig. 33 *a.* ♂. Trochanter and femur of right palp in anterior view,  
 $\times 13.5$ .

34. *Chelifer cervus* Balz.

- Fig. 34 *a.* ♂. Left galea,  $\times 135$ .  
 34 *b.* ♂. Left palp,  $\times 12$ .  
 34 *c.* ♂. Claws of first pair of left legs,  $\times 144$ .  
 34 *d.* ♂. Posterior claw of left leg I. in posterior view,  $\times 144$ .  
 34 *e.* ♂. Posterior claw of left leg IV. in anterior view,  $\times 144$ .

35. *Chelifer depressimanus*, sp. n.

- Fig. 35 *a.* ♀. Left palp,  $\times 19$ .  
 35 *b.* ♀. Chela of right palp in anterior view,  $\times 44$ .  
 35 *c.* ♀. Claws of left leg I.,  $\times 144$ .  
 35 *d.* ♀. Left tarsus IV. in anterior view,  $\times 183$ : *ci*, anterior claw;  
*ce*, posterior claw; *hi*, anterior subterminal hair.

36. *Chelifer nidificator* Balz.

- Fig. 36 *a.* ♂. Finger of left palp in anterior view,  $\times 37$ .  
36 *b.* ♂. Fingers of left palp in posterior view,  $\times 37$ .

37. *Chelifer elongatus* Ell.

- Fig. 37 *a.* ♀. Left palp,  $\times 24$ .  
37 *b.* ♀. Trochanter of right palp in anterior view,  $\times 44$ .  
37 *c.* ♀. Trochanter and femur of right palp in anterior view,  $\times 24$ .  
37 *d.* ♀. Tibia and chela of right palp in posterior view,  $\times 24$ .  
37 *e.* ♀. Immoveable finger of right palp in anterior view,  $\times 44$ .  
37 *f.* ♀. Fingers of right palp in posterior view,  $\times 44$ .  
37 *g.* ♂. (Ellingsen's specimen.) Tibia of right palp,  $\times 24$ ; not in complete dorsal view.



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